

Public Works Officer Safety and Health Resource Guide

10/20/00

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FOREWORD

This document is intended only as a guide. It was originally prepared as a training aid and resource document for Public Works Officers (PWOs), safety and occupational health personnel and others on Navy occupational safety and health (NAVOSH) program requirements. This version is expanded to serve a broader purpose; to be a pertinent resource for facilities-related safety and health information.

Primary references, summary of basic requirements and suggested sources of help are provided for selected NAVOSH topics most commonly found in Public Works operations and issues of safety and health related to facilities.

This guide was originally staffed through major claimants and their field activities. Comments received were incorporated. However, recommendations for changes, additions, etc. are welcome at any time and should be sent to the NAVFACENGCOM Facilities Safety and Health Support Office located at:

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9742 Maryland Avenue
Norfolk, VA 23511-3095

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A copy of form 1426 is provided for this purpose at the back of this document.

NAVY OCCUPATIONAL SAFETY AND HEALTH (NAVOSH) PROGRAM

References: (a) 29 CFR Parts 1910, 1915 & 1926
(b) OPNAVINST 5100.23 Series

Background:

- The CNO NAVOSH program is generally “industrially-oriented”; however all Navy facilities need to be inspected at least annually for safety and health issues, including MWR, family housing, bachelor housing, exchanges, food services, brigs, waterfront, etc.
- Navy has had safety and occupational health programs for many years. *Safety is a line management function.* Bureau of Medicine and Surgery (BUMED) has cognizance for occupational health, including industrial hygiene.
- OSH Act passed on 31 December 1970 is directed at the private sector employer; however, Section 19 of the Act directed Federal Agencies to establish and maintain OSH programs consistent with standards under Section 6 of the Act. Reference (a) identifies subsequent standards issued by Department of Labor, Occupational Safety and Health Administration (OSHA) for (1) General Industry, Part 1910; (2) Shipyard Employment, Part 1915; and (3) Construction Industry, Part 1926.
- Executive Order 12196 and 29 CFR Part 1960 (Basic Program Elements for Federal Employee OSH Programs) require Navy to follow OSHA standards.

Applicability:

- NAVOSH program requirements promulgated in reference (b) apply to all Navy civilian and military personnel and operations ashore with few exceptions.
- Applicability of reference (b) to foreign nationals overseas is dependent upon the applicable Status of Forces Agreement.

Policy:

- Navy policy is to provide a safe and healthful workplace for all personnel and establish programs with the following features:
 - Comply with DOD, SECNAV and OSHA standards.

- At least annual inspections of all workplaces by activity NAVOSH personnel.
- Prompt abatement of identified hazards.
- Procedures for personnel to report hazards to their supervisor and/or OSH personnel without fear of reprisal.
- OSH training for all supervisors and employees.
- Review of facilities and equipment designs by OSH professionals prior to procurement to ensure hazards are eliminated or controlled throughout the life cycle.
- Thorough investigations of mishaps, prompt reporting, and initiation of corrective measures to prevent recurrence.
- Recognition of superior or deficient OSH performance in managers, supervisors and employee performance evaluations.

Inspections/Oversight:

- The Naval Inspector General's NAVOSH Oversight Inspection Unit (NOIU) conducts inspections at the activity level using the Process Review and Measurement System (PR&MS) inspection process.
- OSHA representatives are authorized to conduct target inspections of Navy facilities or may respond to a complaint of unsafe/unhealthful conditions WITH NO ADVANCE NOTICE.

Important CNO, NAVY IG and NAVFACENGCOM web sites:

- CNO NAVOSH: www.navosh.net
- NAVFACENGCOM www.navfac-safety.navy.mil
- Public Works Safety: www.navfac-safety.navy.mil/pblwrks.htm
- Facilities Design Safety: www.navfac-safety.navy.mil/design.htm
- Construction Safety: www.navfac-safety.navy.mil/cnstrctn.htm
- Safety Spec: www.navfac-safety.navy.mil/docs/pdf/guidespec/01525.pdf
- Contractor Accident Reporting: www.navfac-safety.navy.mil/fair/default.htm
- Hire Safe Contractors: : www.navfac-safety.navy.mil/docs/pdf/drft1730.pdf
- Contractor OSHA Citations: www.osha.gov/cgi-bin/est/est1
- Hazard Abatement: www.navfac-safety.navy.mil/ha_proj.htm
- Navy IG Oversight: www.navosh.net/references/strategic/review.pdf

MANAGEMENT/SUPERVISORY RESPONSIBILITIES

References: (a) OPNAVINST 5100.23 Series
(b) NAVFACINST 5100.11 Series
(c) USACE Safety & Health Requirements Manual EM-385-1-1

General:

- The safety and occupational health of Navy military and civilian personnel is an inherent responsibility of command (references (a) and (b)), thus direction and control of activity safety and occupational health programs must be through the chain of command, with line managers and supervisors being primarily responsible.
- Activity safety and occupational health offices perform a staff function and are responsible for program administration and coordination, and for providing guidance and recommendations on safety and occupational health to managers and supervisors.
- The Navy Occupational Safety and Health program is managed by CNO (N-45) through OPNAVINST 5100.23E. Navy is consolidating common safety and health services into regional offices that should provide the traditional safety inspections, safety training, accident reporting, and accident investigation duties. However, each supervisor, team leader, department head, director, and Commander retains responsibility for the daily Navy employee safe work planning and execution.

Supervisory Responsibilities:

- Ensure personnel supervised are properly trained. Specialized safety training such as respiratory protection, asbestos, hazardous materials, etc., is normally conducted by safety and occupational health professionals. Regardless of who provides training (i.e., supervisor, safety staff, training office, etc.), supervisors must ensure their employees have the knowledge to perform their work the right way.
- Investigate mishaps to find causal factors and take corrective action to prevent recurrences.
- Make sure their employees follow written/oral directives including safety rules and standards.
- Identify unsafe/unhealthful acts and conditions and take corrective action.

- Make sure their employees are provided the proper tools, equipment, and personal protective equipment, and that it is properly used and cared for.

Employee Responsibilities:

- Follow safety and occupational health rules and instructions issued by the activity and/or their supervisor.
- Report immediately to the supervisor any injury, illness, or government property damage caused by a mishap.
- Report unsafe or unhealthful conditions to their supervisor.

Contractor Operations:

- Navy contractors are also required to work safely IAW their company safety program which is legally required to comply with local, state or Federal OSHA laws, rules and standards. Many Navy contracts have special safety requirements for high hazard or special hazards work. It is important that contractors not expose Navy employees to any hazards arising from contract work, such as noise, chemicals, fall hazards, asbestos, lead paint, fire, explosions, etc. Navy investigation of contractor accidents is important to determine if corrective actions are needed in future contracts. Reports can be made via the NAVFACENGCOM Safety web page.
- Contractors are required to comply with OSHA standards at all times, and are subject to no notice inspections by OSHA representatives while on Federal property.
- The Federal Acquisition Regulation (FAR) has a standard clause (FAR clause 52.236-13, *Accident Prevention*) which must be inserted in solicitations and contracts when a fixed-price construction contract or a fixed-price dismantling, demolition, or removal of improvements contract is contemplated and the contract amount exceeds the simplified acquisition threshold. The clause should be inserted in construction contracts or dismantling, demolition, removal or improvements contracts under the simplified acquisition threshold. The clause requires contractors to also follow reference (c). ROICC personnel are responsible for enforcing contract provisions including compliance with reference (c). Training and assistance is available from the Engineering Field Divisions. If the contract involves work of a long duration or hazardous nature, the contracting officer shall use the clause with its Alternate I. Use FAR clause 52.223-3, *Hazardous Material Identification*

and Material Safety Data, whenever hazardous material will be brought onto Navy property.

- Construction/Renovation. Naval Facilities Guide Specification (NFGS) 01525, "Safety Requirements," must be specified and enforced for all contracts involving construction, demolition, repair, or renovation.
- Facilities Services. NAVFAC activities that write or contract for facility services shall use the latest version of the NAVFAC Guide Performance Work Statements (GPWS) and incorporate FAR clause 52.236-13 when appropriate.
- Weight Handling Equipment. For weight handling equipment, appropriate sections of NAVFAC P-307 dealing with contractors shall be incorporated into contracts and complied with for operation, maintenance, certification and accident reporting.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) VISITS

References: (a) OPNAVINST 5100.23E, Chapter 11

Basic Requirements:

- Navy facilities, including public works centers, are subject to inspections by compliance officers from the Department of Labor's Occupational Safety and Health Administration. OSHA compliance officers may inspect all navy workplaces except military unique workplaces, workplaces staffed exclusively with military personnel, or workplaces located in foreign countries. With few exceptions, contractor operations at Navy activities are also subject to inspection.
- Navy shore activities shall grant permission for Federal and State Occupational Safety and Health Administration (OSHA) officials, to enter their installations without delay and at reasonable times to conduct inspections of Navy civilian or contractor workplaces. These inspections may be routine or based on reports of unsafe or unhealthful conditions, specific complaints, accidents or illnesses of employees, or part of a targeted inspection.
- Federal and State safety and health officials shall present appropriate identifying credentials and shall state the purpose of the visit to the Navy shore installation commander or his/her authorized representative and to the administrative contracting officer (ACO) (if appropriate), before conducting an inspection of workplaces situated on a Navy shore installation. Appropriate security clearances are required prior to entering any restricted area.
- Only Federal OSHA officials may perform inspections in DoD contractor workplaces situated in areas where the United States holds exclusive Federal jurisdiction.
- Installation commanders shall not provide DoD contractors with advance notice of OSH inspections by Federal or State OSHA officials except:
 - In cases of apparent imminent danger to Navy or contractor employees
 - When specifically requested by Federal OSHA or State OSHA officials.
- Any person who violates the foregoing is subject to a fine of not more than \$1,000 or to imprisonment for not more than 6 months, or both.

- Federal or state OSHA officials or other state safety and health officials shall not take photographs on any Navy shore installation. Only Navy personnel or cleared contractor personnel shall take photographs requested by any such officials. Navy or contractor personnel shall not deliver photographs to the requesting official until all film, negatives, and photographs have been fully screened and classified by proper Navy authority, as appropriate, in the interest of national security. Activities shall forward further requests, by such officials, for documented data, sketches of military installations and equipment, reports or design information (e.g., noise sound levels, profiles, etc.) to the appropriate screening official for similar action.
- Representatives of the Navy shore installation commander and the ACO (if appropriate), may accompany Federal OSHA and state OSHA officials on inspections and investigations. Federal OSHA officials may interview or be accompanied by civilian employees or employee representatives with appropriate clearances during their visit. For contractor workplaces, representatives of the contractor and contractor employees may accompany these officials where requisite security clearances are verified.
- Federal OSHA or state OSHA officials shall have access to, and be provided with, copies of records and reports pertinent to specific Navy contractor accident investigations, upon request, unless prohibited from release by the Privacy Act or exempted from release under the Freedom of Information Act.
- When the cognizant engineering field division (EFD) of the Naval Facilities Engineering Command (COMNAVFACENGCOM) has defined the boundaries, Navy shore installation commanders should advise the applicable state OSHA office in writing of any areas on the installation which are located within an area of exclusive Federal jurisdiction.
- If Federal OSHA officials issue reports or notices of unsafe or unhealthful working conditions discovered during their inspections, the commander of the inspected Navy activity shall forward a summary report with a copy of such notices immediately to CNO (N45) and COMNAVSAFECEN (Code 41). The commanding officer shall provide information copies to the chain of command having management cognizance. The commanding officer shall treat deficiencies discovered during such inspections in the same manner as deficiencies noted during internal Navy inspections.
- Navy shore installation commanders shall refer all information regarding citations and notices issued to Navy contractors for violations of OSHA, state OSHA or other State safety and health standards involving DoD-

furnished equipment, facilities or other property to the responsible ACO for appropriate action. Shore installation commanders shall send a copy to CNO (N45).

- DoD policy states that the contractor is responsible for resolving issues related to citations and initiating requests for delays in compliance with variations, tolerances, or exemptions from applicable OSH standards.
- Installation commanders shall advise CNO (N4), via the chain of command, of any situation resulting from compliance with these procedures that could impair the Navy's ability to properly carry out its mission in support of the national defense or adversely affect the national security.

FED 2000:

The Federal Worker 2000 Program (28 OSHR 577), signed by President Clinton on July 2, 1999, established measurable indicators for Federal agencies that define success in improving safety and health in Federal workplaces. These are:

1. Reduce the total case rate (TCR) of injury/Illness Cases per 100 employees at agencies with rates above 2.0;
2. Decrease the average reporting time by Federal agencies for new injuries and illnesses incurred at work;
3. Reduce the rate of Lost Time Cases (LTCR) per 100 employees at agency locations with rates at or above two times the FY-96 Federal average;
4. Reduce the rate of Lost Production Days (LPDR) per 100 employees due to injury/illness incurred at work.

DoD established the following goals to implement the initiative over five years:

1. Reduce the overall occurrence of injuries by 3% per year, while improving agencies' timeliness in reporting injuries and illnesses to the Department of Labor by 5% each year;
2. Reduce the lost time case rates (LTCR) for those worksites with the highest rates by 10% per year for five years;
3. Reduce the rate of Lost Production Days - that is, the number of days employees spend away from work - by 2% per year.

CNO established NAVOSH Performance Metrics for selected activities in Navy Concentration Areas who were determined to have civilian total case rates (TCR) above 2.6 or lost time case rates (LTCR) above 1.75 or greater than 50% of the Navy 5 year average. These activities will track and report monthly via a web-based reporting system on the following five metrics:

1. Supervision: Number of 2nd level supervisors or above participating in safety and occupational health (SOH) workplace assessments divided by the total number of 2nd level supervisors and above.

2. Compliance: Number of workplace safety and occupational health deficiencies corrected within thirty days divided by the number of safety and occupational health deficiencies identified.
3. Training: Number of personnel trained divided by the total number of personnel to be trained as listed in the safety – training plan.
4. Mishap Prevention: Job hazards analyses performed divided by the number of lost time injuries.
5. Self-Assessment: Number of process deficiencies corrected divided by the total number of process deficiencies listed in the improvement strategy.

In support of FED 2000, OSHA representatives may visit Navy targeted activities to review progress in meeting established goals for improving safety and health in Federal workplaces.

WHAT TO DO IN THE EVENT OF AN ACCIDENT/INCIDENT/MISHAP

References: (a) OPNAVINST 5100.23 Series
(b) NAVFAC P-307

Basic Requirements:

- Activities should have a pre-mishap plan in place. The plan details required actions in the event of a mishap including notification procedures, emergency response procedures, and mishap investigations.
- Notification. Indoctrinate all subordinates, especially new arrivals, to report all mishaps no matter how small, as well as the "near misses" where only chance prevented a mishap. Ensure personnel fully appreciate that activities cannot correct hazardous conditions unless personnel conscientiously report them. The activity should maintain a current roster of personnel who must be contacted in the event of a mishap. Ensure supervisors report all mishaps to the activity OSH office immediately so the OSH office can initiate the appropriate action for the investigation.
- If any Class A mishap or mishap involving the inpatient hospitalization of three or more people occurs, the cognizant headquarters command shall initiate an investigation consistent with this chapter, and shall initiate the investigation within 48 hours of notification of the mishap. The activity where the mishap occurred (or activity employing the Navy personnel involved if off station) shall report this type of mishap by telephone within 8 hours to COMNAVSAFECEN and the cognizant headquarters command. To comply with OSHA notification requirements, the activity must also notify the local OSH office within 8 hours of the mishap when civilian personnel are involved.
- Emergency procedures. When a mishap occurs, the first priority must be providing prompt medical attention/treatment for injured personnel. Ensure personnel are aware of emergency response procedures, including posting of emergency phone numbers. First responders may encounter bloodborne pathogens and should act accordingly. See the bloodborne pathogens section for additional information.
- Once injured personnel are treated and/or transported, steps should be taken to secure the mishap site and to identify witnesses. Except to the extent necessary to protect employees and public, the commander, commanding officer or officer in charge of the activity or location where the mishap occurred shall ensure that employees do not disturb or remove evidence from the mishap scene of any mishap requiring a Headquarters Mishap Investigation Board. Do not release the scene until authorized by the Headquarters' Mishap Investigation Board leader who will coordinate with other investigating bodies (e.g., OSHA, JAG). For serious mishap involving only contractor personnel,

ensure the accident site is secured and evidence is protected, remaining undisturbed until released by the Contracting Officer.

- Investigation. Shore activities are required to conduct a safety investigation of every mishap, major or minor, and handle the investigation as a search for the facts. The severity or significance of the mishap determines the extent of the investigation. The activity shall establish guidelines delineating roles and responsibilities for reporting and investigating all classes of mishaps. The OSH office shall ensure proper investigation of all mishaps and review all investigation reports. Management personnel may assist in mishap investigations; however, activities shall not use information they obtain through the safety investigation for administrative or disciplinary action. The investigator shall complete a written report with firm, factual findings and recommendations for specific corrective action to be taken to prevent recurrence.
- Personnel who conduct Class A, B and C mishap investigations shall complete formal training in mishap investigation procedures and techniques. Commanding officers shall not assign mishap investigation personnel to any other investigation of the same mishap such as a JAG Manual investigation, an Officer Evaluation Board (USN) or a Field Performance Board (USMC). Members of any Mishap Investigation Board shall not, nor may they be requested to, divulge their own opinion or any information which they arrived at, or to which they became privy, in their capacity as a member of a Mishap Investigation Board.
- Chapter 14 of reference (a) provides additional information concerning mishap investigation, reporting and record keeping for shore on-duty mishaps.
- Mishaps involving weight handling equipment (WHE) including WHE operated by a contractor on Government property:
 - a. notify the Navy Crane Center by fax or phone within 24 hours of an accident involving a fatality, in-patient hospitalization, overturned crane, collapsed boom, or any other major damage to the crane or adjacent property.
 - b. within 30 days of any WHE mishap complete and forward to the Navy Crane Center the WHE accident report form contained in Section 12 of reference (b). Include in the report a summary of circumstances, an explanation of causes(s), photographs, and corrective actions taken. Construction contracts shall contain the requirement that WHE mishap information be provided to the Contracting Officer within 30 days of a WHE mishap.

ACCIDENT PREVENTION SIGNS AND TAGS

References: (a) 29 CFR 1910.145
(b) 29 CFR 1926.200
(c) OPNAVINST 5100.23 series

Basic Requirements:

- Accident prevention signs and tags are intended to convey information concerning specific hazards to industrial workers or members of the public who may be exposed to the hazard. Signs and tags may provide warnings specific to the hazard, or they may provide safety instructions.
- Danger signs shall be used only where an immediate hazard exists. Danger signs shall have red as the predominating color for the upper panel; black outline on the borders; and a white lower panel for additional sign wording.
- Caution signs shall be used only to warn against potential hazards or to caution against unsafe practices. Caution signs shall have yellow as the predominating color; black upper panel and borders; yellow lettering of "caution" on the black panel; and the lower yellow panel for additional sign wording. Black lettering shall be used for additional wording.
- Safety instruction signs. Safety instruction signs, when used, shall be white with green upper panel with white letters to convey the principal message. Any additional wording on the sign shall be black letters on the white background.
- Directional signs. Directional signs, other than automotive traffic signs, shall be white with a black panel and a white directional symbol. Any additional wording on the sign shall be black letters on the white background.
- Traffic signs. Construction areas shall be posted with legible traffic signs at points of hazard. All traffic control signs or devices used for protection of construction workmen shall conform to the Manual on Uniform Traffic Control Devices for Streets and Highways.
- Accident prevention tags shall be used as a temporary means of warning employees of an existing hazard, such as defective tools, equipment, etc. They shall not be used in place of, or as a substitute for, accident prevention signs.
- Tags used as part of the Energy Control Program (Lockout/Tagout) shall be singularly identified, shall not be used for other purposes, and shall

be durable and standardized across the facility in terms of color, shape, size, print and format.

ASBESTOS CONTROL PROGRAM

PART I: Asbestos Management Program Ashore

References: (a) OPNAVINST 5100.23 Series Chapter 17
(b) 29 CFR 1910.1001

Inventory:

- All shore facilities are required to locate, verify, document and prioritize asbestos containing materials (ACM) in facilities in accordance with references (a) & (b). Personnel working in areas where ACM is present must be notified and advised of applicable precautions (ref (b) provides additional guidance).
- Inventories must be conducted by EPA-accredited personnel in-house, by PWCs, or through open-end reimbursable contracts maintained by EFDs/EFAs [reference (a), (b)].
- Contract personnel must be informed of location of ACM in facilities [per reference (b)].

Assessment:

- Assess identified facility asbestos hazards for appropriate corrective abatement actions. Assessment for appropriate action must be by EPA accredited personnel [reference (b)]. Guidance for survey and material assessments is provided in reference (a).
- Develop plans and specifications for abatement projects. Determine corrective actions of removal, enclosure or encapsulation for each hazardous location. Personnel developing plans and specs must be EPA accredited [reference (b)].

Design & Abatement:

- Execute abatement actions based on assessment studies. Protect abatement worker and facility occupant's health and safety during abatement actions. Ensure proper disposal of asbestos waste.
- Abatement actions must be conducted by Activity/PWC/PWD personnel, activity contracts or EFD/EFA contracts who have completed required EPA accredited training.

- Centrally managed hazard abatement funds are available for abatement of identified facility asbestos hazards through NAVFACHQ SF.

Operations and Maintenance (O&M) Programs:

- Ensure known/suspected asbestos materials are regularly inspected to minimize employee exposure until abatement actions are completed.
- Minimize damage or disturbance to asbestos materials to prevent further release of fibers.
- Development and Implementation of O&M Plans must be by EPA accredited personnel.

PART II: Workplace Practices

References: (a) OPNAVINST 5100.23 Series (Chapter 17)
 (b) 40 CFR 61
 (c) NFGS-13281
 (d) 29 CFR 1910.1001; 29 CFR 1926.1101
 (e) Technical Memorandum TM-2210-ENV
 (f) Technical Memorandum TM-2211-ENV
 (g) NAVFACINSTRUCTION 5100.11 Series (Chapter 5)

General:

- References (a) and (d) and (g) detail program requirements for controlling/eliminating exposure to asbestos fibers by Navy military and civilian employees at shore facilities.
- Asbestos materials shall not be used in construction, repair or maintenance at shore facilities. Use asbestos free substitute materials.
- Any individual exposed at any time to asbestos fibers in excess of the permissible exposure level (PEL) shall be notified in writing of the exposure.

Basic Requirements:

- Asbestos shall be removed, cut, etc., in a wet state to prevent airborne emissions. All removal must be by accredited personnel.
- Removal operations require use of glove bags or containments and a high efficiency particulate air (HEPA) filtered vacuum or ventilation system.

- Asbestos waste must be double-bagged, placed in color-coded containers, labeled, and disposed of in an approved sanitary landfill operated IAW reference (b) and (d); consult with EFDs prior to disposal.
- Asbestos controlled areas shall not be released for unrestricted access until the area has first been thoroughly cleaned, inspected and air-sampling results are acceptable.
- Personal protective equipment required includes full body Tyvek or equivalent coveralls, hood, rubber gloves, shoe covers and proper respiratory protection.
- Change rooms with “clean” and “dirty” areas and shower facilities must be provided at asbestos work areas. Prior to assignment and annually thereafter, employees who work with asbestos and their supervisors must receive extensive training (requires EPA or state approved training).
- Both personal (employee) air sampling and environmental (area) monitoring is required to characterize exposures to asbestos.
- Preplacement, periodic and termination of employment medical examinations are required.

Contract Work:

- Reference (c) must be specified and enforced for all renovation and demolition work performed by contractors which may impact asbestos. Identify asbestos per reference (b) during the design phase of the renovation or demolition project.
- Reference (e) is an OICC/ROICC Field Procedure Manual for “Managing Asbestos Abatement for Demolition Contracts.”
- Reference (f) is an OICC/ROICC Field Procedure Manual for “Managing Asbestos Abatement for Renovation Contracts.” Both manuals are available from the Naval Facilities Engineering Service Center, Port Hueneme, CA.

Source of Help:

- 1) Activity NAVOSH Personnel
- 2) NAVFACENGCOM SF
- 3) Naval Facilities Engineering Service Center

BLOODBORNE PATHOGENS

References: (a) OPNAVINST 5100.23 Series, Chapter 28
(b) 29 CFR 1910.1030

Basic Requirements:

- Bloodborne Pathogens are pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).
- Each employer having an employee(s) with occupational exposure is required to establish a written Exposure Control Plan designed to eliminate or minimize employee exposure. Occupational exposure means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.
- Per reference (a) for Navy personnel, occupational exposure includes hospital and medical treatment facility personnel, emergency rescue personnel, enforcement personnel, laboratory personnel working with potential bloodborne pathogens, and all other personnel who can reasonably anticipate to have occupational exposure to bloodborne pathogens. The requirement for first aid and Cardiopulmonary Resuscitation (CPR) training alone does not dictate the need to include individuals into programs designed to meet the bloodborne pathogens standard's requirements. Personnel who perform "Good Samaritan" acts that result in potential exposure shall receive the same prompt medical evaluations and follow-up that covered employees receive. Facilities shall follow reference (b) for exposure determination procedures.
- Engineering and work practice controls shall be used to eliminate or minimize employee exposure. Where occupational exposure remains after institution of these controls, personal protective equipment shall also be used.

CONFINED SPACE ENTRY PROGRAM ASHORE OPERATIONS

References: (a) OPNAVINST 5100.23 Series, Chapter 27
(b) 29 CFR Part 1910.146 Permit Required Confined Spaces
(c) NAVSEA S6470-AA-SAF-010 Gas Free Engineering Manual
(d) 29 CFR Part 1915 Subpart B - Confined and Enclosed Spaces
(e) EM-385-1-1 USACE Safety and Health Requirements Manual
(f) NFGS-01525 Safety Requirements

General:

- Navy policy is that activities shall consider all confined spaces or poorly-ventilated enclosed spaces hazardous and prohibit entry into or work on the boundaries of such spaces until the space has been evaluated and the appropriate safety precautions taken.
- *Non-maritime work at non-maritime facilities:* reference (a) provides confined space entry requirements. Reference (a) incorporates reference (b) for non-maritime work at non-maritime facilities.
- *Maritime work at maritime facilities:* reference (c), an approved alternative OSHA standard, provides confined and enclosed space entry requirements for naval maritime facilities which include shipyards, ship repair facilities, shore intermediate maintenance activities (SIMAs), and certain weapons/warfare centers. Maritime work includes work on or in vessels or vessel sections including shipbuilding, ship repair, shipbreaking and related employment on the navigable waters of the United States including dry docks.
- *Maritime work at non-maritime facilities:* reference (d) provides confined and enclosed space entry requirements for these activities (e.g., harbor craft at naval stations).
- *Non-maritime work at maritime facilities:* Activities have the option to follow the procedures in reference (a) and reference (b), or reference (c) while performing non-maritime work at naval maritime facilities.
- *Confined space* is a space that is not designed for routine occupancy but is large enough and so configured that an employee can enter to perform work, is poorly ventilated and/or has limited or restricted means of entry or exit, and contains potential and/or known hazards. At non-maritime facilities a confined space is either a *permit required confined space* (PRCS) or a *non-permit required confined space*.
- *Enclosed space* is a space on a maritime facility which by its nature or design, is of such a shape, depth or other feature that natural ventilation or the natural movement of air is restricted.

- *Confined space and enclosed space hazards* include:
 - a. atmospheric hazards: oxygen-deficiency, oxygen-enrichment, explosive gases and vapors, & toxic air contaminants.
 - b. physical hazards: moving mechanical equipment, energized electrical conductor, in-flowing fluids (caustics, acids, solvents), & heat/cold.

Non-maritime facilities where non-maritime work is performed:

- All confined spaces shall be marked with signs, where practical, warning persons entering the space of the potential hazards, the need for testing prior to entry, and who to call for testing. A Confined Space Program Manager (CSPM) or Assistant Confined Space Manager (ACSPM) appointed by the Commanding Officer, with the assistance of industrial hygiene or safety personnel, shall identify, which confined spaces on a naval installation are permit required confined spaces (PRCS). The CSPM/ACSPM shall maintain a current inventory of all confined spaces, and test each space prior to entry per reference (b).
- Confined space entry permits must be posted at all PRCS entrances, showing test results, type of work authorized, and safety precautions/equipment required.
- All personnel who may enter confined spaces must be trained in recognition of potential hazards and procedures to follow prior to entry.
- Policies and procedures need to ensure that all personnel, including trained attendants and emergency response personnel, clearly understand the potential serious consequences of attempting rescue without the proper rescue equipment. (Multiple fatalities have resulted from attempting rescue without supplied breathing air, harness, lifeline, etc). The CSPM/ACSPM shall prepare a written emergency rescue plan to cover confined space entries under their control.
- All energy sources (electrical, hydraulic, pneumatic, kinetic, potential, mechanical, gravity, or pressurized liquids or gases) which are potentially hazardous to confined space entrants shall be secured, relieved, disconnected and/or restrained (lockout/tagout) before personnel are permitted to enter the confined space. Electrical operations in confined spaces require prior approval by the CO or PWO after specific job hazard analyses have been developed and special controls provided.

Maritime facilities where maritime work is performed:

- Naval maritime facility employees shall be trained to identify confined and enclosed spaces, and trained to contact the activity Gas Free Engineer (GFE) who shall perform all prescribed testing prior to the employee entering the space. The activity Gas Free Engineer (GFE) is appointed by the Commanding Officer and must hold a valid certificate issued by the Navy GFE Certification Board.
- A Gas Free Engineering Certificate shall be issued by the GFE for each confined or poorly-ventilated enclosed space tested in accordance with reference (c). A Gas Free Engineering Log shall be maintained for all tests and inspections of confined or poorly-ventilated enclosed spaces. An annual drill shall be conducted to verify that procedures are established for emergency rescue of personnel from confined and poorly-ventilated enclosed spaces.

Contract Work:

- Contractors are required to comply with the applicable reference (b) or (d). References (e) and (f) must be specified in construction contracts and enforced for all work performed by construction contractors.
- When an activity has knowledge of a confined space, the host employer shall inform the contractor about the confined space including: classification of the space (e.g., permit required confined space); hazards within the space, employer's experience with the space and any precautions or procedures that the host employer had implemented for the protection of employees in or near the space.
- As per references (a), (b), (e) and (f), any potential for a hazard in a confined space requires that a permit space program be implemented. A qualified person shall prepare a USACE ENGFORM 5044-R from reference (e), or other form with the same minimum information, and that the permit shall be posted in a conspicuous place close to the confined space entrance. As per reference (e) a list of confined spaces (permit-required and non-permit required) shall be maintained on site and shall be updated as new confined spaces are discovered.
- Due to liability, contractors shall be required to provide their own competent personnel to test confined spaces they work in. Where Navy personnel and contractor personnel are to occupy the same space at the same time while performing work, Navy personnel must follow the guidance provided in reference (a) for work performed on a non-maritime naval facility, or reference (c) for work performed at a naval maritime facility.

CONSTRUCTION EQUIPMENT

References: (a) NAVFAC P-300 Management of Civil Engineering Support Equipment
(b) NAVFAC P-307 Weight Handling Equipment
(c) 29 CFR 1926, Subparts O and W

Basic Requirements:

- Reference (a) addresses the management of Civil Engineering Support Equipment (CESE). CESE includes automotive vehicles, construction, railway, fire fighting, and mobile weight handling equipment. Weight handling equipment such as portal, gantry, jib and other facility cranes normally fixed are not classified as CESE and are covered by reference (b).
- Construction equipment includes asphalt/water distributors, core drills, earth augers, crawler cranes, ditching machines, excavators, graders, loaders, rollers, scrapers, off-highway trucks, trailers, and tractors, crawler tractors, wheel tractors, sweepers, snowplows, refuse trucks, railroad cars, railway locomotives, truck-mounted cranes, crash cranes, hydraulic cranes, and railway cranes.
- All personnel who are or may be assigned to duties involving the operation of government furnished construction and railroad equipment shall be tested and licensed in accordance with the provisions of reference (a) before being permitted to operate such equipment. Equipment listed above requires licensing under this program. Operators of weight handling equipment must be licensed in accordance with reference (b). DoD contract personnel will not be issued a government license.
- Reference (a) requires persons licensed to operate construction or weight handling equipment to carry a Construction Equipment Operators License, NAVFAC Form 11260/2, as official evidence that the person named therein has been officially accepted as qualified to operate the types of equipment specified on the license. Such license is required to be on one's person when operating specified equipment. The NAVFAC licensing requirement specifically applies to persons operating equipment with a gross vehicle weight greater than 10,000 pounds. Persons operating vehicles with a gross vehicle weight under 10,000 pounds must hold a valid state drivers license.
- Construction equipment or vehicles may not be moved onto any access roadway or grade unless that roadway or grade is constructed and

maintained to safely accommodate movement by the equipment or vehicles involved. Emergency ramps must be designed to control runaway vehicles.

- All earthmoving equipment must have a braking system capable of holding the equipment fully loaded.
- Pneumatic-tired earthmoving haulage equipment whose maximum speed exceeds 15 miles per hour must have fenders on all wheels.
- Rollover protective structures and overhead protection for all earthmoving equipment must be capable of supporting at least two times the weight of the prime mover applied at the point of impact. Such structures and protection must be designed to minimize the likelihood of a complete overturn resulting in the potential for the operator to be crushed. The design must provide vertical clearance of at least 52 inches from the work deck to the ROPS at the point of ingress or egress. If the current ROPS is removed for any reason, a new ROPS must be remounted with equal quality, or better, bolts or welding as required for the original mounting.
- Bi-directional machines must be equipped with a horn distinguishable from the surrounding noise level and must be operated as needed when the machine is in motion in any direction. The horn must always be in operable condition.
- Earthmoving or compacting equipment that has an obstructed view to the rear when in reverse motion, must be equipped with a reverse signal alarm distinguishable from the surrounding noise level. The reverse signal alarm must be used prior to and while the equipment is in use or an employee must signal that it is safe to reverse the equipment.
- Tractors must have seat belts for operators when seated in the normal seating arrangement.

WEIGHT HANDLING EQUIPMENT

- References:**
- (a) OPNAVINST 5100.23 Series, Chapter 31
 - (b) NAVFAC P-307 Management of Weight Handling Equipment
 - (c) 29 CFR 1910.179 through 1910.182, & 1910.184 Cranes
 - (d) 29 CFR 1926, Subpart N – Cranes, Derricks, Hoists
 - (e) EM-385-1-1 USACE Safety and Health Requirements Manual, Sections 15 & 16
 - (f) NFGS-05125 Safety Requirements

General:

- Reference (a) summarizes the minimum requirements and applicable standards for the safe use of all types of weight handling and rigging equipment at Navy shore activities and shore based commands.
- Reference (b) provides administrative and technical criteria for personnel with responsibility for management, inspection, testing, certification, alteration, repair, operation, and/or use of ashore Navy weight handling equipment in order to ensure optimum service life, that the equipment is safe to operate, that weight handling operations are conducted safely and efficiently, and to provide training. Reference (b) complies with references (c) and (d). OSHA has approved reference (b) as the Navy Alternate Standard for Crane Certification required by 29 CFR 1915, 1917, 1918, & 1919.
- Ashore Navy weight handling equipment shall be operated, maintained, inspected, tested, repaired, altered and certified in accordance with reference (b). Ashore Navy weight handling equipment consists of cranes (e.g. portal cranes, mobile cranes), rigging gear (e.g. slings, shackles), and associated equipment (e.g. chainfalls, dynamometers).

Category 1 cranes: portal cranes, hammerhead cranes, locomotive cranes, derricks, floating cranes, tower cranes, container cranes, mobile cranes, aircraft crash cranes;

Category 2 and 3 cranes: overhead traveling cranes, gantry cranes, wall cranes, jib cranes, pillar cranes, pillar jib cranes, monorails and associated hoists, fixed overhead hoists including chainfalls, and pedestal mounted commercial boom assemblies attached to stake trucks/trailers/flatbeds/railcars/stationary mounted to piers (rated capacities less than 2,000 pounds);

Category 4 cranes: commercial truck mounted cranes, truck mounted articulating boom cranes, and pedestal mounted commercial boom assemblies attached to stake trucks/trailers/flatbeds/railcars/stationary mounted to piers (rated capacities 2,000 pounds and greater).

Contract Work:

- Construction contracts shall specify that work performed by contractor owned and operated cranes on Government property shall be in conformance with applicable OSHA Regulations; National Fire Protection Association (NFPA) 10, 70, and 241; EM-385-1-1 [reference (e)]; NFGS-01525 [reference (f)]; *activity regulations* pertaining to crane safety and operation (including allowable crane access routes and ground loading limitations); and the *equipment manufacturer's specifications* and limitations for erection and operation of cranes and hoists used in support of the work.
- Construction contracts shall state that the contractor shall notify the Contracting Officer no less than 5 working days in advance of the intent to bring a contractor-operated crane onto Government property, and that the contractor shall provide the following documentation:
 - a. *Certificate of Compliance.* Contractor cranes being operated on Government property shall have a completed certificate of compliance [form can be found in reference (b)] posted in a conspicuous place on or in the cab of the crane/vehicle to which it pertains. The certificate of compliance shall state that the crane and rigging gear meet all applicable regulations contained in reference (d). The certificate of compliance shall remain posted on the crane while the crane is on Government property.
 - b. *Crane Records.* Cranes used by a contractor shall have in the cab of the crane all pertinent documentation, such as inspection records; crane manufacturer operating manual, including crane equipped operator aids; load rating chart; crane log book that records operating hours; and all crane inspections, tests, maintenance, and repair records.
 - c. *Crane Operator Qualification Documentation.* The contractor shall certify that contractor personnel operating cranes on Government property are qualified and trained to operate the crane to be used, are qualified to perform the assigned work, and have passed a practical operating examination for the specific type of crane being operated. The contractor shall also certify that all of its crane operators have been trained not to bypass safety devices (e.g., anti-two-block devices) during lifting operations.
- *Equipment Usage.* Only equipment/vehicles designed to perform the intended work are authorized for use by contractor personnel. Contractor cranes being operated on Government property shall comply with ASME B30.5 for mobile cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes, as per reference (a).
- A *critical lift plan* shall be prepared by the construction contractor if a critical lift is scheduled. Critical lifts are defined in reference (e). Critical lift plans shall be developed, reviewed, and signed by all personnel involved.

ELECTRICAL SAFETY

References: (a) DoD MIL-HDBK 1025/10, Safety of Electrical Transmission and Distribution Systems
(b) NAVFAC MO-201, Electrical Power Distribution Systems Operations
(c) Navy Handbook OPNAV P-45-117-6-98, Electrical Safety Field Guide
(d) 29 CFR Part 1910.269, Electric Power Generation, Transmission, Distribution
(e) 29 CFR Part 1910.147, Control of Hazardous Energy (Lock-Out/Tag-Out)
(f) OPNAVINST 5100.23 Series
(g) National Electric Code (NFPA 70)
(h) ASTM Volume 10.02, Electrical Protective Equipment
(i) 29 CFR Parts 1910.331 - 1910.335 (Safety Related Work Practices)

Basic Requirements:

- Reference (a) provides guidelines on the safe operation and maintenance of electrical equipment and installations used for transmission and distribution of electric power, including guidance for shore-to-ship operations. Reference (b) provides additional guidance on maintenance and operations. Reference (c) provides summarized safety requirements and rules of reference (a) for electrical work in the field as performed by electrical supervisors, foremen, and crew members involved in inspection, switching, maintenance, line clearance, testing, and fault-locating.
- Reference (d) requires all personnel working on or near high voltage electrical distribution apparatus be qualified for the work. To be qualified they must demonstrate adequate skills and techniques to: 1) distinguish exposed live parts from other parts of electrical equipment; 2) determine the nominal voltage of exposed live parts; and 3) maintain minimum clearance distances corresponding to the voltages to which they are exposed.
- All activities must implement a Lock-Out/Tag-Out Program IAW references (e) and (f).
- All construction site areas must have either an assured equipment grounding conductor program or be protected with ground fault circuit interrupters (GFCI) (29 CFR 1926.404).

- Shops using automotive diagnostic equipment, shop lights, or electric hand tools must also be protected with GFCI.
- Use of flexible cords and cables is restricted to “temporary service” [per reference (g)].
- The path to ground from all circuits and equipment must be permanent and continuous. All disconnecting means must be labeled unless device controlled is apparent.
- First aid/CPR training shall be provided to personnel identified by the activity safety manager (e.g., high voltage workers).
- Specifications and periodic testing requirements for electrical protective equipment (insulating gloves, blankets, matting, etc.) is provided in reference (h).
- Electrical safety work practices are established for or around electrical equipment [reference (i)]. Working clearances shall be maintained in front of electrical equipment to not less than 30 inches.
- Live-line, bare hand work on any transmission or distribution line over 50 volts to ground is prohibited.

EMERGENCY ACTION AND FIRE PROTECTION

References: (a) 29 CFR 1910.38

Basic Requirements:

- Every building or structure designed for human occupancy shall be provided with enough exits to permit the prompt escape of occupants in case of fire or other emergency.
- Every exit shall be clearly visible or the route to reach it shall be conspicuously indicated so that any occupant who is physically and mentally capable will readily know the direction of escape from any point. Each path of escape, in its entirety, shall be so arranged or marked that the way to a place of safety outside is unmistakable. Any doorway or passageway that is not an exit or way to reach an exit, but which could be mistaken for an exit, shall be so arranged or marked as to minimize its possible confusion with an exit.
- In every building or structure equipped for artificial illumination, adequate and reliable illumination shall be provided for all exit facilities.
- Required exits, paths of travel to the exit and paths of travel from the exit into the street or open space shall be kept clear at all times.
- Every automatic sprinkler system, fire detection and alarm system, exit lighting, fire door, and other item of equipment, where provided, shall be in proper operating condition at all times.

Emergency Action Plans.

- Emergency action plans are required by reference (a). Emergency action plans must be in writing and include the following elements:
 - Emergency escape procedures and emergency escape route assignments;
 - Procedures to be followed by employees who remain to operate critical plant operations before they evacuate;
 - Procedures to account for all employees after emergency evacuation has been completed;
 - Rescue and medical duties for those employees who are to perform them;
 - The preferred means of reporting fires and other emergencies; and
 - Names or regular job titles of persons or departments who can be contacted for further information or explanation of duties under the plan.
- The employer shall establish an employee alarm system which complies with 29 CFR 1910.165. If the employee alarm system is used for alerting fire brigade members, or for other purposes, a distinctive signal for each purpose shall be used.

- Before implementing the emergency action plan, a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees must be designated and trained.
- Review the plan with each employee covered by the plan at the following times:
 - Initially when the plan is developed,
 - Whenever the employee's responsibilities or designated actions under the plan change, and
 - Whenever the plan is changed.
- Review with each employee upon initial assignment those parts of the plan that the employee must know to protect the employee in the event of an emergency. The written plan shall be kept at the workplace and made available for employee review

Fire Prevention Plans

- Fire prevention plans are required by reference (a). The fire prevention plan shall be in writing and include the following elements:
 - A list of the major workplace fire hazards and their proper handling and storage procedures, potential ignition sources (such as welding, smoking and others) and their control procedures, and the type of fire protection equipment or systems which can control a fire involving them;
 - Names or regular job titles of those personnel responsible for maintenance of equipment and systems installed to prevent or control ignitions or fires; and
 - Names or regular job titles of those personnel responsible for control of fuel source hazards.
- Control accumulations of flammable and combustible waste materials and residues so that they do not contribute to a fire emergency. The housekeeping procedures shall be included in the written fire prevention plan.
- Apprise employees of the fire hazards of the materials and processes to which they are exposed.
- Review with each employee upon initial assignment those parts of the fire prevention plan that the employee must know to protect the employee in the event of an emergency. The written plan shall be kept in the workplace and made available for employee review.
- Regularly and properly maintain, according to established procedures, equipment and systems installed on heat producing equipment to prevent accidental ignition of combustible materials. The maintenance procedures shall be included in the written fire prevention plan.

ERGONOMICS

Reference:

- (a) DOD Instruction 6055.1, Department of Defense Occupational Safety and Health Program
- (b) OPNAVINST 5100.23 Series, Chapter 23
- (c) DOD MIL-STD-1472, Department of Defense Design Criteria Standard, Human Engineering

General:

- Ergonomic injury prevention is one of the Chief of Naval Operation's (CNO) special emphasis items. Approximately 50% of the Navy's compensation costs can be attributed to ergonomic work related musculoskeletal disorder (WMSD) injuries. Ergonomics is the field of study that involves the application of knowledge about physiological, psychological and biomechanical capacities and limitations of the human. This knowledge is applied in the design of work environments, jobs, tools and equipment to enhance performance, safety and health. Ergonomics is essentially fitting the workplace to the worker. The better this fit, the higher the level of safety and work efficiency.
- WMSD injuries attributable to poor ergonomic designs include but are not limited to: carpal tunnel syndrome, tendonitis, white finger, trigger finger syndrome, back strain and sprains.
- Ergonomic hazards are workplace conditions that embody risk factors for WMSDs. Risk factors include repetitive motions, awkward body positioning, static body postures, force, work/rest regimens, vibration or other similar factors that pose a biomechanical, anatomical or psychological stress to a worker.

Basic Requirements:

- Reference (a) requires a written plan for a comprehensive ergonomic program. The plan at a minimum shall include goals and objectives; program interface with existing illness and injury prevention and medical programs; and the six critical elements for ergonomic intervention; 1) workplace analysis, 2) hazard prevention and control, 3) health care management, 4) education and training, 5) evaluation and 6) acquisition.
- Each activity shall develop, implement and integrate ergonomic guidelines and standards into existing Safety and Occupation Health (SOH) training programs. Engineering staffs responsible for planning, designing or writing specifications for equipment, tools, jobs, tasks and processes shall receive formal training and instructions in methods of eliminating or reducing ergonomic risk factors for WMSDs in the work place.

- Each activity shall consider ergonomic design criteria during procurement of weapon systems, facilities, and equipment to help reduce the life-cycle costs due to ergonomic injuries.
- Reference (b) requires NAVFACENGCOM to perform comprehensive ergonomic hazard analyses as part of the facility design process. Plans for new or modified facilities, processes, materials and equipment need to ensure that changes will reduce or eliminate ergonomic hazards.
- All activities must conduct an annual analysis of its injury/illness experience to analyze (WMSD), experiences and other ergonomic hazards. The analysis should identify specific department codes or operations experiencing WMSD cases so they may be targeted for training, medical surveillance, and engineering studies to eliminate hazards.
- A survey of industrial shops and workplaces in identified high-risk departments or job operations shall be conducted. Reference (a) provides checklists for evaluation of industrial shops and for workstations equipped with video display terminals.
- The preferred method of abating ergonomic hazards is to eliminate the process or use engineering controls such as redesign of workstations, work methods and tools to control/eliminate the risk factors. Reference (c) contains detailed guidance on principles/techniques for implementing engineering controls.
- Aggressive management action is necessary to prevent WMSD injuries and to control claims and costs. Employee involvement is likewise essential for identification of existing and potential hazards, and for correcting hazards.
- Medical aspects of the program should be coordinated with your local Naval medical hospital/clinic who are responsible for support in the form of therapy and treatment programs, assistance in implementing light duty programs, and establishment of physical requirements for job placement.

Sources of Help: 1) Activity NAVOSH Personnel
 2) Naval Medical Hospital/Clinic
 3) Navy Corporate Ergonomics Plan

FALL PROTECTION

References: (a) 29 CFR Part 1926
(b) 29 CFR Part 1910
(c) USACE Safety & Health Requirements Manual, EM 385-1-1

General:

- Handrails and guardrails are two forms of conventional fall protection. Whenever possible, engineer out potential hazards by using conventional forms of fall protection rather than personal fall restraint or arrest systems.
- Designs for new or renovated facilities should consider and eliminate potential fall hazards for operational, maintenance, and contractor personnel.
- Work performed on unprotected walking/working surfaces greater than 6 feet from a lower level requires use of fall protection systems.
- Fall protection systems consist of :
 - Guardrails
 - Full-body harness with a maximum six (6) ft. lanyard (personal fall arrest)
 - Lifelines (vertical and horizontal)
 - Safety Nets
 - Warning Lines
 - Safety Monitoring Systems
- Where personal fall arrest is required, it must be fully utilized to ensure no exposure to a fall hazard is permitted.
- When employees are expected to move continuously on unprotected walking/working surfaces the work shall be evaluated by those doing the work and the supervisor to determine the type of fall arrest system (such as a horizontal lifeline for anchorage to allow movement).
- No person shall wear or use fall arrest devices without completing training prior to use of this equipment, per references (a) and (b). Training shall include the following:
 - Fall hazards in the workplace and how to recognize them
 - The purpose of fall protection systems and their limitations
 - Review of the requirements of the Fall Protection Program

- Use, care, operation, and inspection of applicable fall protection systems
- The role of employees in fall protection plans and emergency rescue

Fall Arrest Systems: Four main points to consider include anchorage, connecting means, body support and rescue.

- Anchorage
 - A secure structure which withstands forces exerted by fall arrest and rescue equipment. This can include a beam, girder, column or floor.
 - Minimum strength requirement is 5000 lbs.
 - Improvised anchorages must be unquestionably strong and used with certified anchorage connectors.
 - Horizontal lifelines must always be designed by a qualified, professional engineer. Forces on the end anchorages of a horizontal lifeline are considerably greater than impact forces in the vertical plane.
- Connecting Means
 - A secure structure which can withstand forces exerted by fall arrest and rescue equipment. This can include a beam, girder, column or floor.
 - Minimum strength requirement is 5000 lbs.
- Body Support
 - The full body harness is the most common body holding device intended to support the worker's weight in the event of a fall.
 - The only attachment point for fall arrest is the dorsal D-ring.
 - The frontal D-ring attachment must be used only for ladder climbing or descent control.
 - Thoroughly inspect harnesses daily for frayed threads, cuts, tears, or loose connections.
 - Any unit that has seen fall arrest forces must be removed from service immediately.
- Rescue
 - Wherever a worker is at risk of a fall, plans for rescue must be in place.
 - Rescue is an important aspect of any fall protection program.

HANTAVIRUS

Background:

- The hantavirus leads to the Hantavirus Pulmonary Syndrome (HPS), an often fatal infection of the lungs. The hantavirus first became a recognized health concern in the U.S. in May of 1993, when a number of deaths attributed to HPS occurred in the four-corners region in the Southwest. Since then, the virus has also been identified in other states across the country.
- Rodents are the *reservoir host* of the recognized hantavirus. Each hantavirus appears to have a preferred rodent host, but other small mammals (i.e., pinon mice, brush mice and western chipmunks) can be infected as well. Data strongly suggests that the deer mouse is the primary carrier in the U.S. except on the East Coast and Southeast where the cotton rat has been identified as a carrier of the virus causing HPS.

Risk of HPS:

- HPS risk is very low in the general population, but certain occupational and recreational activities increase the risk of infection. The information provided here is intended to help reduce the risk during these activities.
- Although knowledge of the disease and its distribution is not complete, precautions should be taken whenever activities involve possible contact with rodents or rodent excreta (droppings, urine, and saliva). Areas in which there may be an increased risk include:
 - Rural or suburban buildings or outbuildings surrounded by rodent habitats (i.e., open space, vegetation, borrows, etc.).
 - Vacant cabins or buildings
 - Crawl spaces or attics
 - Electrical vaults
 - Ordnance bunkers
 - Storage sheds
- Persons who should take precautions to protect themselves from hantavirus include:
 - Pest control operators
 - Wildlife biologists or handlers
 - Janitors or clean-up crews
 - Construction workers
 - Electrical repairmen and plumbers

- Ordnance handlers

Risk Reduction:

- In general, avoiding contact with rodents and their excreta is the best method for reducing the risk of infection. In some cases, though, this is unavoidable because of occupation or facility conditions. ***This may be of particular concern for those facilities which have been in a layaway condition for extended periods.*** Use the following guidelines to reduce the risk:
 - Take precautions when entering any space that has been vacant for a long period of time and that is potentially rodent infested. Avoid creating airborne contaminants. If there is doubt as to the condition of the space, don PPE (i.e., HEPS filter half or full face respirator, non vented goggles, rubber or plastic gloves, disposable coveralls w/hood and boots or shoe covers) before entering.
 - Identify whether the work or living space is infested with rodents. Look for droppings, nests, gnaw marks, live or dead rodents, etc.
 - Disinfect and remove rodent excreta and carcasses. Spray contaminated materials with a commercial disinfectant (a solution of 3 tablespoons bleach in 1 gallon of water can be substituted). Allow the disinfectant to soak the material for 10 minutes then wipe (avoid sweeping or vacuuming) into a plastic bag and seal. Place in another plastic bag, seal and deposit in trash can. If rodents are trapped, discard traps or disinfect if they are to be reused. Exposure to 20 minutes of direct sunlight will also kill viruses on materials that cannot be easily disinfected with a solution. *A/ways* use PPE when cleaning.
 - Baseline blood serum samples should be drawn and stored at a local medical facility for persons involved in high risk activities.
 - Persons involved in high risk activities should seek immediate medical attention for any flu-like illnesses for up to 45 days following the activity. They should also inform the attending physician of exposure to rodents and/or their excreta.

Sources of Help: 1) Naval Medical Hospital/Clinic
 2) Entomologist from the Navy's Environmental and Preventive Medicine Unit
 3) Activity NAVOSH Personnel

HAZARDOUS MATERIAL

- References:**
- (a) DODINST 6050.5
 - (b) OPNAVINST 5100.23 Series
 - (c) OPNAVINST 5090.1 Series
 - (d) 29 CFR Part 1910.1200 Hazard Communication
 - (e) EM-385-1-1 USACE Safety and Health Requirements
 - (f) NFGS-01525 Safety Requirements
 - (g) 29 CFR Part 1926.59 Hazard Communication

Basic Requirements:

- The Navy has established a policy for life-cycle control of hazardous material (HM). Environment, safety and health considerations shall be included in all HM planning and acquisition.
- Activities shall limit the amount of HM.
- Less hazardous materials shall be substituted whenever possible.
- Each activity is required to have:
 - A written hazard communication program
 - A complete inventory of all hazardous material (HM) used in the workplace including quantity, stock number, common name, and disposal requirements
 - Material Safety Data Sheets (MSDS) for each HM
 - MSDS available during each shift to all employees
 - Procedures established to ensure all containers of HM are labeled with identity and appropriate hazard warnings
 - Establish procedures for informing contractor personnel of HM used at the command
 - A written HM training program
 - An authorized HM use list
- Activities shall also implement the Hazardous Substances Management System (HSMS), including establishment of HAZMIN Centers to facilitate the central management of all HM at the activity.
- All Navy activities are responsible for the prevention and control of pollution from hazardous materials, including hazardous waste. The Resource Conservation and Recovery Act (RCRA) sets forth national strategy for management of hazardous waste (HW). The strategy, implemented by the Environmental Protection Agency, involves identification, management, and tracking of HW from the time it is generated until the time it is properly disposed.

- Some hazardous materials pose a greater threat than others and are addressed individually by the Navy and/or OSHA. For example, other sections of this manual address issues associated with asbestos and lead. The following hazardous materials also warrant special attention.
- Polychlorinated Biphenyls (PCBs) are chemical substances that have biphenyl molecules that have been chlorinated to varying degrees or any combination of substances that contain such substance. Occupational exposures to PCBs may arise from processes such as retrofilling PCB-containing electrical transformers, removing PCB-impregnated felts or gaskets, or working with synthetic rubber, plasticizers or other materials which contain PCBs. Chapter 25 of reference (b) and Chapter 11 of reference (c) provide Navy policy concerning PCBs, including control methodologies.
- Methylene chloride (MC) is a colorless, volatile, nonflammable liquid with a penetrating, ether-like odor. Worker exposures to MC occur mainly through breathing its vapors. MC can also pass through workers' skin if it gets on their body or clothes. Occasionally, workers can swallow small amounts of MC if they don't wash their face and hands before eating, or if they eat in contaminated work areas. Short-term exposure to high levels of MC can cause dizziness, headaches, a lack of coordination, and irritation of the skin, eyes, mucous membranes, and respiratory system. OSHA considers MC to be a potential occupational carcinogen. Exposure to MC may also make the symptoms of heart disease (e.g., chest pains, angina) worse. MC exposure in construction activities may occur when workers are stripping paint or other coatings, applying foam, painting with epoxy paint, cleaning equipment with solvents, and spraying adhesives. Workers are more likely to be exposed to high levels of MC when working in small, enclosed spaces that are not well ventilated. Refer to 29 CFR 1926.1152 for specific guidance concerning methylene chloride in construction activities.

Contract Work:

- Reference (e) and (f) must be specified and enforced on contracts for construction, demolition, repair, or renovation.
- A written hazard communication program shall be prepared by the contractor in accordance with references (e) and (g) for protecting personnel and property during the transport, storage and use of hazardous materials.
- The contractor's hazard communication plan shall address, as a minimum, the following:
 - Emergency procedures for spill response and disposal of hazardous materials.

- Construction equipment, including cranes, regardless of location, shall have adequate oil absorbent material staged at the site to contain a hydraulic component/system failure/leak. Contractors are responsible to clean up non-emergency oil and hazardous substance spills from their equipment. (The contractor shall notify the Contracting Officers designated representative when setting up for HAZMAT conditions.)
 - Labeling system to identify contents on all containers on-site.
 - Current inventory of hazardous chemical on site.
 - Location and use of Material Safety Data Sheets (MSDSs) at the Government jobsite.
 - Training (to include potential safety and health effects from exposure to hazardous substances).
 - The notification process when hazardous substances are brought onto the Government job site and that all employees potentially exposed to the substance will be advised of information in the MSDS for the substance.
- Radioactive materials or instruments capable of producing ionizing/non-ionizing radiation as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, or lead-based paint are prohibited on the Government jobsite under the Hazardous Materials Exclusions clause of reference (f).

Sources of Help: 1) Activity Hazardous Material Control Manager
2) Activity NAVOSH/Environmental Personnel
3) EFDs Code 18
4) Navy Environmental Health Center

HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE

References: (a) 29 CFR 1910.120

Background:

- Reference (a) addresses hazardous waste operations at hazardous waste sites. These include:
 - Clean-up operations required by a governmental body, whether Federal, state local or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites (including, but not limited to, the EPA's National Priority Site List (NPL), state priority site lists, sites recommended for the EPA NPL, and initial investigations of government identified sites which are conducted before the presence or absence of hazardous substances has been ascertained;
 - Corrective actions involving clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA);
 - Voluntary clean-up operations at sites recognized by Federal, state, local or other governmental bodies as uncontrolled hazardous waste sites;
 - Operations involving hazardous waste that are conducted at treatment, storage, disposal (TSD) facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA; or by agencies under agreement with U.S.E.P.A. to implement RCRA regulations; and
 - Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.
- Employers shall develop and implement a written safety and health program for their employees involved in hazardous waste operations. The program shall be designed to identify, evaluate, and control safety and health hazards, and provide for emergency response for hazardous waste operations.
- An employer who retains contractor or sub-contractor services for work in hazardous waste operations shall inform those contractors, sub-contractors, or their representatives of the site emergency response procedures and any potential fire, explosion, health, safety or other hazards of the hazardous waste operation that have been identified by the employer's information program.
- Any information concerning the chemical, physical, and toxicological properties of each substance known or expected to be present on site that

is available to the employer and relevant to the duties an employee is expected to perform shall be made available to the affected employees prior to the commencement of their work activities. The employer may utilize information developed for the hazard communication standard for this purpose

- Appropriate site control procedures shall be implemented to control employee exposure to hazardous substances before clean-up work begins.
- All employees working on site (such as but not limited to equipment operators, general laborers and others) exposed to hazardous substances, health hazards, or safety hazards and their supervisors and management responsible for the site shall receive training meeting the requirements of reference (a) before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards. Employees shall not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.
- Employees who are engaged in responding to hazardous emergency situations at hazardous waste clean-up sites that may expose them to hazardous substances shall be trained in how to respond to such expected emergencies.
- Refer to reference (a) for additional requirements.

HISTOPLASMOSIS – BIRD AND BAT EXCRETA HEALTH PROBLEM

References: (a) DHHS (NIOSH) Publication No. 97-146 September 1997,
Histoplasmosis Protecting Workers at Risk

Background:

- Histoplasmosis is an infectious disease caused by inhaling the spores of a fungus called *Histoplasma capsulatum*. Histoplasmosis is not contagious; it cannot be transmitted from an infected person or animal to someone else. Histoplasmosis primarily affects a person's lungs, and its symptoms vary greatly. The vast majority of infected people have no apparent ill effects, or they experience symptoms so mild they do not seek medical attention. If symptoms do occur, they will usually start within 3 to 17 days after exposure, with an average of 10 days. Histoplasmosis can appear as a mild, flu-like respiratory illness and has a combination of symptoms, including malaise (a general ill feeling), fever, chest pain, dry or nonproductive cough, headache, loss of appetite, shortness of breath, joint and muscle pains, chills, and hoarseness. A chest X-ray can reveal distinct markings on an infected person's lungs. Chronic lung disease due to histoplasmosis resembles tuberculosis and can worsen over months or years. Special antifungal medications are needed to arrest the disease. The most severe and rarest form of this disease is disseminated histoplasmosis, which involves spreading of the fungus to other organs outside the lungs. Reference (a) provides additional information.
- *H. capsulatum* grows in soils throughout the world. The fungus seems to grow best in soils having a high nitrogen content, especially those enriched with bird manure or bat droppings. The organism can be carried on the wings, feet, and beaks of birds and infect soil under roosting sites or manure accumulations inside or outside buildings. Active and inactive roosts of blackbirds (e.g., starlings, grackles, red-winged blackbirds, and cowbirds) have been found heavily contaminated by *H. capsulatum*. Therefore, the soil in a stand of trees where blackbirds have roosted for 3 or more years should be suspected of being contaminated by the fungus. Habitats of pigeons and bats have also been found contaminated by *H. capsulatum*. On the other hand, fresh bird droppings on surfaces such as sidewalks and windowsills have not been shown to present a health risk for histoplasmosis because birds themselves do not appear to be infected by *H. capsulatum*. Rather, bird manure is primarily a nutrient source for the growth of *H. capsulatum* already present in soil. Unlike birds, bats can become infected with *H. capsulatum* and consequently can excrete the organism in their droppings.
- Testing field samples for *H. capsulatum* will be impractical in most situations. Consequently, when thorough testing is not done, the safest approach is to assume that the soil in regions where *H. capsulatum* is endemic and any accumulations of bat droppings or bird manure are contaminated with *H.*

capsulatum and to take appropriate exposure precautions. Testing field samples for *H. capsulatum* will be impractical in most situations.

Risk of Histoplasmosis:

- NIOSH and the National Center for Infectious Diseases provide a partial list of occupations with risks for exposure to *H. capsulatum* spores. The list includes bridge inspectors or painters, chimney cleaners, construction workers, demolition workers, farmers, gardeners, heating and air-conditioning system installers or service personnel, microbiology laboratory workers, pest control workers, restorers of historic or abandoned buildings, and roofers. Appropriate exposure precautions should be taken by these people and others whenever contaminated soil, bat droppings, or bird manure are disturbed. If someone who engages in these activities develops flu-like symptoms days or even weeks after disturbing material that might be contaminated with *H. capsulatum*, and the illness worsens rather than subsides after a few days, medical care should be sought and the health care provider informed about the exposure.

Risk Reduction:

- The best work practice is to prevent the accumulation of manure in the first place. Therefore, when a colony of bats or a flock of birds is discovered roosting in a building, immediate action should be taken to exclude the intruders by sealing all entry points. Any measure that might unnecessarily harm or kill a bat or bird should be avoided.
- Areas known or suspected of being contaminated by *H. capsulatum*, such as bird roosts, or attics, should be posted with signs warning of the health risk.
- Before an activity is started that may disturb any material that might be contaminated by *H. capsulatum*, workers should be informed in writing of the personal risk factors that increase an individual's chances of developing histoplasmosis. Such a written communication should include a warning that individuals with weakened immune systems are at the greatest risk of developing severe and disseminated histoplasmosis if they become infected.
- The best way to prevent exposure to *H. capsulatum* spores is to avoid situations where material that might be contaminated can become aerosolized and subsequently inhaled. Therefore, work practices and dust control measures that eliminate or reduce dust generation during the removal of bat or bird manure from a building will also reduce risks of infection and subsequent development of disease.
- Disinfectants have occasionally been used to treat contaminated soil and accumulations of bat manure when removal was impractical or as a precaution

before a removal process was started. Formaldehyde solutions are the only disinfectants proven to be effective for decontaminating soil containing *H. capsulatum*.

- Any material that might be contaminated with *H. capsulatum* that is removed from a work site should be disposed of or decontaminated properly and safely and not merely moved to another area where it could still be a health hazard. Before an activity is started, the quantity of material to be removed should be estimated.
- Dusts containing *H. capsulatum* spores can be aerosolized during construction, excavation, or demolition. Once airborne, spores can be carried easily by wind currents over long distances. Water sprays or other dust suppression techniques should be used to reduce the amount of dust aerosolized during construction, excavation, or demolition in regions where *H. capsulatum* is endemic. During windy periods or other times when typical dust suppression techniques are ineffective, earthmoving activities should be interrupted. All earthmoving equipment (e.g., bulldozers, trucks, and front-end loaders) should have cabs with air-conditioning (if available) to protect their operators.
- Because work practices and dust control measures to reduce worker exposures to *H. capsulatum* have not been fully evaluated, using personal protective equipment is still necessary during some activities. During removal of an accumulation of bat or bird manure from an enclosed area such as an attic, dust control measures should be used, but wearing a NIOSH-approved respirator and other items of personal protective equipment is also recommended to reduce further the risk of *H. capsulatum* exposure.

Sources of Help: 1) Navy Environmental Health Center

LASERS

References: (a) 29 CFR 1926.54
(b) OPNAVINST 5100.23 Series, Chapter 22

Background: The widespread use of laser in both commercial and military applications increases the probability of exposure to personal injury from laser radiation. It is Navy policy to identify and control laser radiation hazards as a matter of military necessity.

Basic Requirements:

- Reference (a) is OSHA's Nonionizing Radiation standard for the construction industry; it provides general requirements for lasers used on construction sites and is not appropriate for other applications such as medical and industrial laser products. Since 1960, the laser has found many applications in industry and construction, including surveying, mechanical measurements, drilling, and welding. Lasers produce monochromatic high intensity light beams, frequently capable of causing significant eye damage and body burns.
- Commands operating Class III or Class IV commercial or military exempt lasers shall establish a laser safety program and designate a Laser System Safety Officer (LSSO) per SPAWARINST 5100.12B to ensure personnel are not exposed in excess of the PEL. The laser safety program shall include an inventory of all commercial - Class IIIb, Class IV and all classes of Military-Exempt Lasers that are assigned to the command. Contact your activity LSSO if you have questions concerning lasers under your cognizance.
- Only qualified and trained employees shall be assigned to install, adjust, and operate laser equipment. Proof of qualification of the laser equipment operator shall be available and in possession of the operator at all times.
- Employees, when working in areas in which a potential exposure to direct or reflected laser light greater than 0.005 watts (5 milliwatts) exists, shall be provided with antilaser eye protection devices.
- Areas in which lasers are used shall be posted with standard laser warning placards.
- Beam shutters or caps shall be utilized, or the laser turned off, when laser transmission is not actually required. When the laser is left unattended for a substantial period of time, such as during lunch hour, overnight, or at change of shifts, the laser shall be turned off.
- Only mechanical or electronic means shall be used as a detector for guiding the internal alignment of the laser.

- The laser beam shall not be directed at employees.
- When it is raining or snowing, or when there is dust or fog in the air, the operation of laser systems shall be prohibited where practicable; in any event, employees shall be kept out of range of the area of source and target during such weather conditions.
- Laser equipment shall bear a label to indicate maximum output.
- Employees shall not be exposed to light intensities above:
 - Direct staring: 1 micro-watt per square centimeter;
 - Incidental observing: 1 milliwatt per square centimeter;
 - Diffused reflected light: 2 1/2 watts per square centimeter.
- Laser unit in operation should be set up above the heads of the employees, when possible.
- Employees shall not be exposed to microwave power densities in excess of 10 milliwatts per square centimeter.
- Reference (b) provides information concerning OSH issues associated with the use of lasers.

Sources of Help: 1) Command Laser Systems Safety Officer
 2) Commander, Dahlgren Division, Naval Surface Warfare Center, Code G71 (Laser Safety)

LEAD

References: (a) Residential Lead-Based Paint Hazard Reduction Act of 1992 (Title X)
(b) OSHA, 29 CFR 1926.62, Lead Exposure in Construction
(c) OSHA, 29 CFR 1910.1025, Lead
(d) OPNAVINST 5100.23E, Chapter 21
(e) NAVFAC Guide Specification 13283, Removal and Disposal of Lead-Containing Paint
(f) NAVFAC Guide Specification 13282 Removal and Disposal of Materials Containing Lead
(g) Technical Memorandum TM-2285-ENV Lead Paint Removal Quality Assurance Manual For Renovation/Demolition Contracts At Non-Housing/Non-Child-Occupied Facilities

General:

- Reference (a) is Congressional direction to OSHA, EPA, and Housing and Urban Development (HUD) to issue regulations regarding lead-based paint hazards. Reference (b) is the OSHA construction industry standard, which focuses on worker protection during construction, maintenance and repair work. EPA and HUD regulations primarily focus on family housing operations and protection of children from lead hazards.
- General industry lead activities, such as radiation shielding, handling ballast, small arms ammunition, etc., are addressed in references (c) and (d).

Construction and Facilities:

- All construction, alteration and repair activities where lead exposure may occur, such as demolition, removal/encapsulation of leaded materials, renovation of structures containing lead, installation of lead products, clean-up of lead contamination, or maintenance operations associated with the above are regulated by reference (b).
- Reference (e) must be specified for all contracts involving removal and disposal of lead-containing paint. Reference (f) is for the removal of materials or building components that contain lead. Reference (g) provides guidance for OICC/ROICC construction management for projects involving removal of lead paint.
- In general, the Navy recommends managing lead paint in-place and performing preventive maintenance to keep painted surfaces from

deterioration. Wholesale testing and removal of paint is not recommended.

Housing:

- Reference (a) required EPA and HUD to issue regulations that focus on housing. Navy policy follows the EPA regulations to disclose information regarding lead paint in housing when occupants move into housing units.
- Additional regulations require training by EPA accredited training providers or State licensing to perform lead-based paint (LBP) activities (abatement of hazards).
- Housing occupants are to be notified in advance of maintenance or repair work that disturbs more than 2 square feet of a painted surface.
- EPA has issued guidance on LBP hazards, which include paint, dust and soil. These regulations will be finalized in the near future.

Sources of Help: 1) Activity NAVOSH Personnel
2) NAVFACENGCOM SF
3) Naval Facilities Engineering Service Center

LOCKOUT/TAGOUT PROGRAM

References: (a) 29 CFR Part 1910.147 Control of Hazardous Energy
(b) OPNAVINST 5100.23 Series, Chapter 24
(c) EM-385-1-1 USACE Safety and Health Requirements Manual, Section 12

General:

- Reference (a) is the OSHA standard that covers servicing and maintenance of machines and equipment in which the unexpected energization or start-up of the machines or equipment, or release of stored energy could cause injury to employees.
- Reference (b) establishes Navy policy and minimum procedures for locking out or tagging out the sources of energy to equipment or systems under the requirements of 29 CFR 1910.147, and under the guidance of ANSI Z 44.1-1932.
- Reference (c) must be specified in all construction contracts and enforced for all work involving hazardous energy performed by construction contractors.

Basic Requirements:

- Personnel shall not enter the “danger zone” of a machine or equipment where unexpected start-up or release of stored energy (i.e. electrical, hydraulic, pneumatic, kinetic, potential, mechanical, gravity, or pressurized liquids or gases) could cause injury or property damage.
- The host activity (or the construction contractor for their jobsite work) shall develop a hazardous energy control program that describes the specific energy control requirements and lockout/tagout procedures for the machines or equipment being serviced/inspected/maintained.
- The authorized employee who applies lockout/tagout shall ensure all stored energy has been dissipated and verify all electrical conductors have been de-energized. This means all hazardous energy in the “danger zone” of the machine or equipment being inspected is secured (e.g. electrical panel – all voltages/currents need to be identified, tested and secured within that panel). Pertaining to hazardous “electrical” energy the activity’s or contractor’s qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which the affected employee(s) will be exposed in order to verify that the circuit elements and equipment parts are deenergized including determining that no energized

condition exists as a result of inadvertently induced voltage or unregulated voltage backfeed.

- As per reference (b) lockout, not tagout is the preferred method of energy control and shall be used where feasible. Activities shall not use combination locks for lockout. No two lockout devices (locks) shall have the same key. No more than two keys shall exist for any lock.
- If an energy isolating device is not capable of being locked out, a tagout system may be used. Tagout tags for control of hazardous energy shall only be used in conjunction with additional safety measures such as removal of an isolating circuit element, blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent energization.
- As per reference (b) both lockout and tagout devices shall indicate the identity of the employee applying the device(s). Tagout devices shall indicate the cognizant shop or code, the telephone number where the employee can be reached during working hours, his/her supervisor, date applied, the machine, equipment or system component that is deenergized, and shall include a legend such as "DO NOT START," "DO NOT OPEN," "DO NOT CLOSE," "DO NOT ENERGIZE." Attaching a tag with the above information to a lockout device is a recommended practice.
- Locks and tags shall be removed only by the employee applying the lockout/tagout. If the authorized employee applying the lock and lockout tag, or tagout tag is not available to remove it, the employee's supervisor or other designated employee identified on the lockout/tagout tag shall personally verify that the unavailable employee is no longer in the area or working on the equipment which required energy controls.

MEDICAL AND FIRST AID

References: (a) 29 CFR 1910.151
(b) 29 CFR 1926.50
(c) OPNAVINST 5100.23E, paragraph 0602.f

Basic Requirements:

- The Occupational Safety and Health Administration (OSHA) (references (a) and (b)) requires employers to ensure the ready availability of medical personnel for advice and consultation on matters of occupational health. BUMED maintains medical treatment facilities in many areas; these facilities meet the OSHA requirement.
- In such a facility is not reasonably accessible in terms of time and distance to the work site, a person who has a valid certificate in first-aid training from the U.S. Bureau of Mines, the American Red Cross, or equivalent training that can be verified by documentary evidence, shall be available at the work site to render first aid. For Navy personnel, the primary source of CPR training should be through the American Heart Association facilitator located at Navy hospitals and clinics.
- In a 1994 interpretation, OSHA indicated that in areas where accidents resulting in suffocation, severe bleeding, or other life threatening or permanently disabling injury or illness can be expected, a 3 to 4 minute response time, from time of injury to time of administering first aid, is required. In other circumstances, i.e., where a life-threatening or permanently disabling injury is an unlikely outcome of an accident, a longer response time such as 15 minutes is acceptable.
- First aid and/or CPR training shall be provided to those personnel who require it due to the nature of their work and responsibility. Reference (c) specifically requires training for emergency response teams, electrical power plant personnel, power distribution personnel, electrical and electronics personnel, personnel who work at remote sites, personnel whose jobs pose comparable risks to the above personnel, and supervisors of personnel in the categories above. Position descriptions for these positions should include the requirement for training and administering CPR as a condition of employment for Navy civilian personnel.
- First aid supplies approved by the consulting physician shall be readily available. For construction sites, the contents of the first aid kit shall be placed in a weatherproof container with individual sealed packages for each type of item. It shall be checked by the employer before being sent out on each job and at least weekly on each job to ensure that the

expended items are replaced. An example of the minimal contents of a generic first aid kit is described in American National Standard (ANSI) Z308.1-1998, Minimum Requirements for Industrial Unit-Type First Aid Kits. It establishes minimum performance for first aid kits and their contents used in work environments. The contents of the kit listed in the ANSI standard should be adequate for small work sites. When larger operations or multiple operations are being conducted at the same location, employers should determine the need for additional first aid kits at the work site, additional types of first aid equipment and supplies and additional quantities and types of supplies and equipment in the first aid kits.

- Provisions shall be made prior to commencement of any construction project for prompt medical attention in case of serious injury. Proper equipment for prompt transportation of the injured person to a physician or hospital, or a communication system for contacting necessary ambulance service, shall be provided. In areas where 911 is not available, the telephone numbers of the physicians, hospitals, or ambulances shall be conspicuously posted.
- If it is reasonably anticipated employees will be exposed to blood or other potentially infectious materials while using first-aid supplies, employers should provide personal protective equipment (PPE). Appropriate PPE includes gloves, gowns, face shields, masks and eye protection. See the section on Bloodborne Pathogens.
- Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Work centers shall activate plumbed units weekly for a minimum of 3 minutes to flush the line and to verify proper operation. Activities shall service self-contained eyewash units quarterly or per the manufacturer's recommendations, whichever is more frequent. Activities shall not use personal eyewash (hand-held units) in locations that require eye wash units.

MOTOR VEHICLES

Reference: (a) OPNAVINST 5100.12 Series
(b) DOD Regulation 4500 36-R
(c) OPNAVINST 5102.1 Series
(d) NAVFAC P-300, Management of Civil Engineering Support Equipment

General:

- Policy and guidance for implementation of the Navy Traffic Safety Program is provided in reference (a) and applies to:
 - All Navy military personnel at all times (on and off Naval Stations)
 - All Navy civilian personnel in a duty status (on and off a Naval Station)
 - All persons in/on any Navy motor vehicle (on and off a Naval Station)

Basic Requirements:

- Navy motor vehicles are required to pass a safety and exhaust emissions inspection annually in addition to the inspection requirement in reference (b).
- Seat belts must be worn by all personnel operating or riding in motor vehicles on Naval property (except busses not equipped with seat belts).
- Personnel shall not ride in cargo areas of vehicles unless the vehicle has been modified to include installation of seat belts.
- All traffic control devices or signs must conform to ANSI D6.1, "Manual for Uniform Traffic Control Devices for Streets and Highways."
- No person shall drive or require another to drive a motor vehicle during any duty period unless that duty period was preceded by at least eight consecutive hours off duty.
- Personnel shall not be required to drive for more than 10 hours or after having been on duty for 15 hours or after 8 hours if the vehicle is carrying explosives or other hazardous cargo. (NOTE: Fire, crash and rescue personnel assigned 24 hour rotating shifts with sleeping accommodations are exempted.)
- Wearing portable headphones, earphones, etc., while operating a motor vehicle, while jogging, walking, bicycling on Naval Station roads is prohibited.

- All motorcycle operators must successfully complete training courses approved and/or conducted by the Naval Safety Center.
- Headlights shall be turned on at all times while operating motorcycles.
- Motorcycle operators/passengers must wear:
 - US DOT approved helmets
 - Eyeglasses, goggles or face shield attached to the helmet
 - Long sleeved shirt/jacket, long legged trousers and full finger leather gloves
 - Hart-soled shoes with heels
 - Yellow or orange vest with 1 1/2 to 2 inch wide reflective strips front or back
- Motor vehicle mishaps required to be investigated and reported under reference (c) include:
 - Government motor vehicle mishaps when there is \$2,000 in property damage, a fatality or lost time to DOD personnel, or a fatality or injury requiring treatment greater than first aid to a non-DOD personnel
 - Private motor vehicle mishaps which result in a fatality or lost time injury to military or non-duty DOD civilian personnel, or \$2,000 damage to DOD property
- Reference (d) provides guidance concerning the Commercial Driver's License Program (CDLP) established by the Commercial Motor Vehicle Act of 1986. The provisions of the Act apply both to interstate and intrastate drivers. Drivers of commercial vehicles must have a single driver's license; be tested for the knowledge and skills needed to drive a commercial motor vehicle; and be disqualified from driving a commercial motor vehicle if the driver commits certain criminal or traffic violations. A commercial vehicle is defined as being a vehicle that: (1) Has a manufacturer's gross vehicle weight rating (GVWR) or gross combination weight rating (GCWR) of 26,001 pounds or more, or has a GCWR, inclusive of a towed unit with a GVWR of more than 10,000 pounds; or (2) Is designed to carry 16 or more passengers, including the driver; or (3) Is of any size and used in the transportation of hazardous materials in a quantity requiring placarding by federal law or regulations. Personnel who operate a commercial motor vehicle on public highways must possess a state-issued Commercial Driver's License (CDL). The following personnel are waived/exempted from the Act's requirements and are not required to obtain/possess a CDL: (1) Military personnel on active duty who operate equipment owned or operated by the Department of Defense in pursuit of military purposes. (2) All operators

of fire fighting and other emergency equipment. (3) Operators of farming equipment.

Sources of Help: 1) Activity NAVOSH Personnel
 2) Naval Safety Center (Motor Vehicle Safety Division)

PERSONAL PROTECTIVE EQUIPMENT (PPE)

References: (a) OPNAVINST 5100.23 Series
(b) 29 CFR Part 1910 Subpart I Personal Protective Equipment

General:

- Once hazards are identified there are generally four corrective measures which may be taken. These measures, in order of priority in which they should be applied, are:
 - Eliminate or minimize the hazard through substitution or engineering controls
 - Isolate the hazard from people
 - Provide training and supervise workers to work with the existing hazard
 - Provide personal protective equipment
- If a hazard cannot be eliminated then a combination of corrective measures including isolation, training and PPE is normally needed to provide adequate protection for personnel.
- The employer shall verify that the required workplace hazard assessment has been performed through a written certification per references (a) and (b).
- A trained safety professional in conjunction with the workplace supervisor and/or employee(s) should select the proper type of PPE based upon degree of protection afforded, and the ease with which it may be used.
- PPE selected is required to meet extensive research/testing requirements. "Approved" equipment must meet American National Standards Institute (ANSI) specifications and Federal or military specifications
- Activities are responsible for providing required approved PPE to their employees and enforcing its use per reference (a).
- Activities shall provide documented detailed training to all employees required to use PPE

Basic Requirements:

- Eye/Face Protection

- Eye and/or face injuries can be caused by flying particles and chips, splashes from liquids such as acids, caustics and solvents, operations that generate hot slag or molten metal, welding glare, etc.
- ANSI Z87.1 provides guidance for the selection, care and use of eye and face protection
- Eye and face protective devices tested and approved for industrial use will be marked to indicate the manufacturer and also have a “Z87” logo
- Head Protection
 - ANSI Z89.1 establishes specifications for hard hats to protect workers from impact and penetration from falling objects and electrical shock
 - Each hard hat consists of a shell and an energy absorbing suspension system
 - Hats meeting Z89.1 specifications and all tests are marked on the inside of the shell to indicate the manufacturer, ANSI Z89.1 logo, and class of the hat. Hats are divided into the following classes:
 - Class A - offers electrical insulation protection from low voltages
 - Class B - offers electrical insulation protection from high voltages
 - Class C - offers no electrical insulation protection
 - Hats should be kept free from abrasions, scrapes and nicks which could adversely effect their impact and/or electrical resistance. Likewise, hats should not be stored on the rear window shelf of an automobile since sunlight and extreme heat may cause degradation. Hard hats shall not be painted. Metal hard hats are not authorized.
- Foot Protection
 - Activity Commanders with advice from safety professionals shall determine foot hazardous areas/operations, identify the type of foot protection required and furnish or reimburse for the purchase of appropriate safety shoes/boots at government expense
 - Approved safety shoes/boots shall meet ANSI Z41 and be marked inside with the ANSI Z41 logo
 - Chapter 20 of reference (a) provides standard stock numbers for standard safety shoes, semi-conductive safety shoes, boots and electrical hazard safety shoes (up to 600 volts)
- Hearing Protection
 - Hearing protection is required whenever personnel are exposed to sound levels greater than 84db (A) or 140db peak sound pressure level for impact or impulse noise
 - Equipment which produce high noise levels and/or hazardous noise areas are to be labeled with hazardous noise decals/labels
 - Personnel exposed to hazardous noise are required to have initial and periodic audiograms

- Appendix 18-A of reference (a) identifies approved hearing protective devices
- Electrical Protective Devices
 - Rubber protective equipment for electrical workers must meet the American Society for Testing and Materials (ASTM) Standards for Electrical Protective Equipment for workers as follows:
 - * Rubber Matting - ASTM D178
 - * Rubber Insulating Gloves - ASTM D120
 - * Rubber Insulating Blankets - ASTM D1048
 - * Rubber Insulating Hoods - ASTM D1049
 - * Rubber Insulating Line Hose - ASTM D1050
 - * Rubber Insulating Sleeves - ASTM D1051
 - High Voltage Electricians should be provided with electrical grade hard hat, electrical grade safety shoes, electrical insulating gloves with leather protective sleeves, Nomex shirts/coveralls, and other basic PPE.
- Respiratory Protection
 - In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to this section.
 - Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protection program.
 - Activities shall fit test, issue and train personnel to wear respirators and ensure personnel are medically qualified to wear a respirator.
 - The activity Respiratory Protection Program Manager (RPPM) is required to maintain a list of those personnel authorized to wear respiratory protection.
 - Personnel with facial hair or any other condition that interferes with the face-to-facepiece seal or valve function may not wear respirators with tight-fitting facepieces.
 - Navy policy prohibits the use of voluntary respiratory use programs as provided for by reference (b).

- Activities shall only use respirators which are currently approved by the National Institute of Occupational Safety and Health (NIOSH) or NIOSH/Mine Safety and Health Administration (MSHA).
- Activities shall not fit test personnel or assign them to work in, or permit them to enter, areas requiring respiratory protection unless they have been medically evaluated.
- Activities shall fit test each individual required to use a respirator, with a tight-fitting facepiece, at the time of initial fitting and annually thereafter.
- The activity shall ensure proper respirator use by providing all employees required to use respirators with training prior to use and annually thereafter.
- Respirators must be maintained and properly stored when not in use.

Sources of Help: 1) Activity NAVOSH Personnel
2) Activity Respiratory Protection Program Manager

PORTABLE LADDERS

References: (a) 29 CFR Part 1910.25 Portable Wood Ladders
(b) 29 CFR Part 1910.26 Portable Metal Ladders

General:

- Guidance on selection, care and use of portable ladders is outlined in references (a) and (b).
- Ladder selection is dependent upon kind of activity involved and the height the ladder must reach so that the climber may work from a safe position.
- Inspect ladders prior to each use; damaged or bent ladders must be tagged out and removed from service.
- Set up ladder on a firm, level surface. Do not place ladders on boxes, chairs, scaffolding, or other movable things to gain a height advantage.
- Aluminum ladders must not be used while performing work near any energized electrical lines.
- Always ascend or descend a ladder while facing it.
- Keep body centered on ladder while working, belt buckle should never pass beyond ladder rails.
- Securely tie down ladders when transporting them on vehicles.
- Do not paint wooden ladders. Paint hides defects and can create a slippery climbing surface.
- Do not move ladders with material still on them, such as tools, paint containers and brushes.

Step Ladders:

- Fully open step ladders. Lock the spreaders and pail shelf into position.
- Do not stand above the second step from the top.
- The back of a step ladder is not designed for climbing.
- A closed step ladder is not designed for use as a straight ladder, it may slip out.

Straight and Extension Ladders:

- Do not use ladder or ladder sections upside down.
- Safety feet are required when working on surfaces where ladder slippage could occur.
- Place the ladder top so both rails are supported.
- The base should be one foot out for each four feet of ladder working length.
- Stake, tie down, or block the lower end of the ladder whenever possible, or have someone hold ladder in place.
- Tie down the ladder top whenever possible, especially in windy weather.
- Do not stand above the fourth rung from the top.
- Extend ladder out at least three feet above roof edges, work platforms, or ground surfaces.

Job Made Ladders:

- Must be constructed and used as outlined in reference (b)

Sources of Help: 1) Activity NAVOSH Personnel

POISONOUS PLANTS AND ANIMALS

References: (a) 29 CFR 1926.

Basic Requirements:

Poisonous plants.

- In job site areas where harmful plants or animals are present, employees who may be exposed shall be instructed regarding the potential hazards, and how to avoid injury, and the first aid procedures to be used in the event of injury.
- Poison ivy, oak, or sumac is found in every state except Alaska and Hawaii. All three species and their sub species of plants are very hardy and adaptable. If there is at least eight to ten inches of rain a year, and it is below 4,000 feet, you can find poison ivy, oak or sumac. Interestingly, poison ivy is generally found in the eastern half of the United States, where poison oak is found all over the west coast.
- Poison Ivy has three leaves, and can creep as much as ten feet up trees, rocks and walls. The berries can be white or light blue in color. Most prevalent in the mid-western United States and the mid-Atlantic region. Poison Oak is found over the entire west coast and the southern half of the United States in non-desert regions. The leaves resemble those of an oak tree, but are in the same clusters of three as poison ivy and have the same small berries. Poison Sumac can have groups of six leaves or ten leaves.
- Poison ivy, poison oak and poison sumac cause a short-lived but extremely irritating allergic form of contact dermatitis. The rash generally develops within 2 days, peaks after 5 days, and starts to decline after about a week or 10 days. While some people survive exposure without ill effects, complete immunity is unlikely; people who seem immune at one time and place may find themselves vulnerable in other situations. Symptoms include patches of red, itchy skin, usually followed by small blisters, which fill with a clear fluid and eventually break open. Severe cases can develop into swollen, extremely painful areas filled with fluid. The rash rarely appears on the soles of the feet or palms of the hand.
- If you come in contact with poison ivy, oak or sumac, or a animal exposed to any of these, or tools, gear, or clothing exposed to any of these, you should wash off with hot water (not so hot that it burns) and strong soap as soon as possible. If you can get washed up in the first six hours, before the first symptoms appear, you have a good chance of avoiding an out break, and an even better chance of minimizing the effects if you do have one.

Poisonous animals.

- A black widow spider has a somewhat round, shiny black abdomen with red markings on the underside. Outdoors they live under rocks, down tree limbs, and in firewood piles. Indoors they may be found in basements and crawlspaces, and sometimes in secluded places in garages and sheds. Their bite may cause pain and serious illness; if bitten a person should place ice on the wound and seek medical attention. Wear gloves when working around wood piles or moving items in sheds and garages. Be cautious of spider webs when working in basements and crawlspaces. Use aerosol insecticides to control spiders in difficult to clean locations.
- Brown recluse spiders belong to a group of spiders commonly known as violin spiders or fiddlebacks because of a characteristic fiddle-shaped pattern they have on their head region. The spider is golden brown with the fiddle being dark brown or black. This spider is not hairy and the fiddle pattern is often shiny. They are about 1/4 to 3/4 inch long. Brown recluse spiders are found primarily in the Midwest. Many cases of bites are reported from Texas, Kansas, Missouri, and Oklahoma. The edge of its range just reaches the tip of western Virginia. The spider commonly lives in basements and garages of houses and often hides behind boards and boxes. Bites often occur when the spiders hide in towels or old clothes left in those areas. The symptoms may vary from no harm at all to a reaction that is very severe. Often there is a systemic reaction within 24-36 hours characterized by restlessness, fever, chills, nausea, weakness, and joint pain. Where the bite occurs there is often tissue death and skin is sloughed off. In some severe cases, a wound may develop that lasts several months. In all cases, a physician should be notified. If at all possible, kill and take the spider to the physician for positive identification. Individual spiders can be crushed underfoot or sprayed with an aerosol spray. Clean up and remove any potential hiding places. Spiders are seldom aggressive and bite only when threatened or injured.
- Insects that sting include bumblebees, honeybees, hornets, wasps, and yellow jackets. Symptoms include quick, sharp pain, swelling, itching, redness at the sting site, and hives. Insect stings can even result in a severe allergic reaction. Symptoms of this include severe swelling all over and/or of the face, tongue, lips, weakness, dizziness, a difficult time breathing or swallowing, and sometimes death due to airway obstruction or shock. Symptoms of a severe allergic reaction usually happen soon after or within an hour of the sting. If a worker has ever had an allergic reaction to an insect sting in the past, then he or she should carry an emergency kit that has adrenaline (a medicine called epinephrine that stops the body-wide reaction) and a device with a needle to inject it, an antihistamine, an inhaler that contains adrenaline, and an instruction sheet that explains how to use the kit. The worker can get this kit from his or her doctor. The worker should also wear a medical alert tag that lets others know that he or she is allergic to insect stings. Persons who have had severe

reactions in the past to bee or wasp stings should ask their doctor about allergy shots.

POWER ELEVATED MOBILE WORK PLATFORMS

Reference: (a) ANSI/SIA A92.2-1990 "Vehicle Mounted Elevating & Rotating Aerial Devices
(b) ANSI/SIA A92.6-1990 "Self Propelled Elevating Work Platforms"
(c) 29 CFR Part 1926.453, Aerial Lifts
(d) 29 CFR Part 1910.269 and 331-335
(e) 29 CFR Part 1910.67 Vehicle-Mounted Elevating and Rotating Work Platforms

Basic Requirements:

- Only trained and properly licensed personnel shall operate lifting equipment.
- Lifting controls shall be tested prior to each use.
- Damaged or defective equipment shall be repaired before using.
- Work platforms shall not be operated until set-up level on a firm base.
- Guardrails shall be utilized on all elevated work platforms. Working outside the confines of the work platform or bucket is prohibited.
- Personal fall arrest systems are required when working from an articulating or extendible boom, scissors lift, swing stages, or suspended platform. The lanyard shall be attached to an anchorage capable of supporting at least 5,000 pounds per person or shall be designed by the original equipment manufacturer with a factor of safety of at least two. For aerial lifting equipment that extends away from its base, such as articulating and extendable boom, the point of attachment or the anchorage location shall be at the boom, not the basket.
- Belting off to an adjacent pole, structure, or equipment while working from an aerial lift is not permitted.
- The use of ladders, planks, or makeshift devices on platforms to obtain greater height is prohibited. Employees shall always stand firmly on the floor of the basket.
- Do not operate near electrical power line or equipment unless:
 - Personnel are properly trained in accordance with reference (d)
 - Equipment is designed to be utilized in electrical work
 - Equipment test records are up to date (yearly test is required)

- Boom, basket and platform load limits specified by the manufacturer shall not be exceeded. Weight load testing shall be conducted annually or following repairs.
- Aerial lift brakes shall be set and outriggers positioned on pads or a solid base. Wheel chocks shall be installed before using on an incline.

POWERED INDUSTRIAL TRUCKS

References: (a) 29 CFR Part 1926.602(c), Lifting and Hauling Equipment
(b) 29 CFR Part 1910.178 Powered Industrial Trucks
(c) NFPA 505-1992
(d) ANSI B56.6-1993

Basic Requirements:

- Per references (a) and (b), only trained/authorized operators are permitted to operate powered industrial trucks. The employer shall certify that each operator has been trained and evaluated as required by paragraph (l) of reference (b). The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation. An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years.
- Modifications must not be made on any powered industrial truck without prior written approval from the manufacturer.
- Nameplates shall be legible and posted on vehicle, indicating truck capacity, approximate weight, and any instructional information.
- Only approved powered industrial trucks may be used in hazardous locations. The atmosphere or location of powered industrial truck use shall be classified prior to consideration of what type of truck to use in that area. Trucks are designated as approved by a recognized testing laboratory for specific hazardous locations and are so marked. A summary table on use of powered industrial trucks in hazardous locations can be found in references (b) and (c).
- At the beginning of each shift, powered industrial trucks must be inspected for operational condition. Any vehicle, not in safe operating condition is to be removed from service.
- Every truck shall be equipped with operator controlled sound producing warning device.
- When vehicles are left unattended, load engaging means shall be lowered, controls neutralized, power off, and brakes set.
- No persons should be permitted to stand or pass under the elevated portion of any truck.

- No additional persons are allowed to ride on powered industrial trucks unless a safe place and seat belt is provided.
- A load or backrest guard shall be used as protection against falling objects.
- An overhead guard shall be used as protection against falling objects.
- Whenever a powered industrial truck is equipped for lifting personnel; the platform must be secured to the lifting carriage or forks, means provided for personnel to shut off power to the truck, and overhead protection from falling objects may be necessary.
- If a load is lifted by two or more trucks working in unison, the proportion of the total load carried by any one truck shall not exceed its capacity.
- Steering or spinning knobs are not permitted on steering wheels unless the steering mechanism is the type that prevents road reactions from causing the wheel to spin.
- Only trucks meeting ANSI B56.1-1993 criteria (design, construction, stability, inspection, testing, maintenance and operation) shall be used.
- Rough terrain forklifts as defined in reference (d) shall not be used to elevate personnel under any circumstances.
- ANSI B56.1-1993, Safety Standard for Low Lift and High Lift Trucks, requires manufacturers to provide, and operators to wear operator restraint systems. OSHA does not currently have a specific standard requiring the use of an operator restraint system. However, the use of operator restraint systems is enforced through OSHA's General Duty clause (Section 5(a)(1) of the Occupational Safety and Health Act), which requires that each employer furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees. In addition, paragraph 178(l) of reference (b) requires employers to train all operators in operating instructions, warnings, or precautions, listed in the operator's manual, such as the use of operator restraint systems.

Sources of Help: 1) Activity NAVOSH Personnel
2) NAVSUPSYSCOM Code 453

ROOFING

References: (a) 29 CFR Part 1926
(b) 29 CFR Part 1910
(c) USACE Safety & Health Requirements Manual, EM 385-1-1

General:

- During construction, demolition or repair of roofs, protective devices must be provided which will prevent personnel from falling off the roof, and also prevent personnel on lower levels from being struck by falling objects. Protective devices must meet references (a) and (b).
- Additional hazards and necessary precautions which should be addressed prior to start of work include:
 - Structural stability of the roof for the additional loads (personnel, equipment, materials) and roof-mounted skylights during entire job
 - Inclement weather (including high winds, snow, lightning, etc.)
 - Access to roof and means of egress during routine and emergency situations
 - Hazardous materials including coal tar pitch, flammable/combustible liquids and potential asbestos hazards (from roofing materials containing asbestos)
 - Electrical hazards due to electrical power transmission and distribution systems
 - References (a) through (c) provide specific requirements and safeguards for dealing with these hazards

Basic Requirements:

Fall Protection:

- **Low-Slope Roofs** (having a slope less than or equal to 4 in 12 vertical to horizontal): Each employee engaged in roofing activities on low-slope roofs with unprotected sides and edges 6 feet or more above lower levels shall be protected from falling by guardrail systems, safety net systems, personal fall arrest systems or a combination of:
 - Warning line system and guardrail system

- Warning line system and safety net system
 - Warning line system and personal fall arrest system, or
 - Warning line system and safety monitoring system
 - On roofs 50 feet or less in width, the use of a safety monitoring system without a warning line system is permitted
- **Steep Slope Roofs** (having a slope greater than 4 in 12 vertical to horizontal): Each employee on a steep roof with unprotected sides and edges 6 feet or more above lower levels shall be protected by guardrail systems with toeboards, safety net systems, or personal fall arrest systems
- **Material Handling/Storage**
 - On all roofs greater than 16 feet in height, a hoisting device, stairway or progressive platforms shall be provided for supplying materials and equipment
 - When employees must work near roof edges, such as during materials handling operations, they must be protected either by a guardrail, safety net, or personal fall arrest system.
 - When guardrails are used at hoisting areas, a minimum of 4 feet of guardrail must be erected on each side of the access point through which materials are hoisted. A chain or gate shall be placed across the opening when hoisting operations are not being performed
 - Material may not be stored within 6 feet of the roof edge unless guardrails are erected at the roof edge.
- **Equipment Use**
 - Mechanical equipment shall not be used or stored in areas where Safety Monitoring Systems are being used to protect employees
- **Hazardous Materials**
 - Coal tar pitch may contain cancer causing chemicals
 - Shingles and other roofing materials may contain asbestos requiring special precautions during removal and disposal

NOTE: Obtain advice/recommendations from your safety office and/or servicing industrial hygienist concerning the safe use of hazardous materials
- **Training**

- Employees must be trained in the following areas:
 - * Nature of fall hazards
 - * Function, use and operation of motion-stopping systems (guardrails, safety nets, personal fall arrest systems), warning lines and safety monitoring systems
 - * Limitations on the use of mechanical equipment
 - * Correct procedures for hoisting and storage of equipment and materials
 - * Personal protective equipment and clothing

SCAFFOLDS

References: (a) 29 CFR Part 1926.451 Scaffolds
(b) 29 CFR Part 1910.28 Safety Requirements for Scaffolding
(c) USACE Safety & Health Requirements Manual EM-385-1-1, Section 22

General:

- Scaffold safety is primarily dependent upon proper erection and use of equipment.
- Scaffolding requirements discussed below cover equipment and operations typical of most operations. They are not all inclusive. Supplemental safety and precautionary measures may be required to cover unusual conditions.
- References (a) through (c) and manufacturer manuals provide specific safety requirements for scaffolds.

Basic Requirements:

- A “Competent Person” shall supervise the erection, dismantlement, or movement of any scaffolding.
- All personnel constructing or utilizing scaffolding shall be instructed in their proper and safe use.
- All equipment shall be inspected before each use. Damaged or weakened scaffold and equipment shall be repaired immediately or pulled from service.
- Scaffold legs shall be set on bases placed on mud sills or other foundations adequate to support the maximum intended load.
- Adjusting screw bases shall be used to compensate for any unevenness of ground or working surfaces. Unstable objects such as boxes, loose bricks or cinder blocks shall not be used. Adjusting screws may not extend more than 12 inches.
- Scaffolding and their components shall be able to support four times their intended load.
- Scaffolds shall be level, plumb, and rigidly braced at all times.

- Guardrails and toe boards shall be used on all open sides and ends of scaffoldings 10 feet or more in height. Wire mesh screening should be used between toe board and guard railings whenever persons are required to pass near scaffolding.
- Personnel on scaffolds exposed to overhead hazards shall be provided with overhead protection.
- Ladders or steps shall be provided to scaffold platforms. Scaffolding bracing shall not be utilized as a access means.
- Running scaffold shall be tied to and securely braced to the structure at intervals not to exceed 30 feet horizontally and 26 feet vertically.
- Work shall not be performed on scaffolding during high winds or storms.
- Scaffolds must not be placed in proximity of power lines or energized equipment unless special precautions are taken.
- All scaffold accessories shall be used and installed in accordance with manufacturer's recommended procedures. Scaffolding components from different manufacturers shall not be assembled together.

General Planking Requirements:

- All load carrying timber members of scaffold framings shall be a minimum of 1,500 feet (stress grade/construction grade lumber).
- Wood planking used on scaffolding shall be specifically graded for scaffold use by approved grading rules.
- Wood planking must have at least 12 inches overlap and extend six inches beyond centers of support or be cleated. Unsupported plank ends shall not extend 12 inches beyond end supports.
- Plank span shall not exceed 10 feet and platform shall be fully planked.
- Loads on planked surfaces must be uniformly distributed.

Manually Propelled Mobile Scaffolds:

- The height of free standing mobile scaffold towers shall not exceed four times the minimum base dimension.
- Wheels or casters shall be provided with a positive locking device.

- Set the brake locking device on casters when erecting, dismantling, climbing or descending and when in a stationary position.
- Do not attempt to move a mobile scaffold from the top. Apply the force necessary to move the scaffold as close to the base as practical.
- Mobile scaffolds shall only be moved on level surfaces, free of obstructions and openings.
- Employees shall not ride mobile scaffolding
- Mobile scaffolds constructed of metal or metal members, shall also conform to appropriate tubular welded frame or tube and coupler scaffold standards.

Suspended Powered Scaffolds:

- Rigging shall be installed and inspected daily by a competent person.
- All rigging and equipment shall be installed according to manufacturer's recommendations and applicable references.
- Installation Requirements:
 - Outrigger beams, roof irons, hooks and clamps, or other rope supporting devices shall be capable of carrying four times the maximum rated load. The integrity of the building or structure to which equipment is attached or rested upon, must be verified by a competent person prior to installation.
 - Tiebacks having the equivalent strength of hoisting ropes shall be firmly secured, without slack, at right angles to the building. When tiebacks cannot be installed at right angles to structure face, two tiebacks should be attached to each supporting device to prevent movement.
 - If outrigger beams are used for rope support, the inner end shall be restrained from vertical movement allowing the beam to be capable of safely supporting an applied rope load of four to one. When counter-weights are utilized for beam restraint, they shall carry an adequate weight value, and be securely fastened to the beam.

- When drum wrapping hoisting machines are used, the rope shall remain on the drum at least four wraps at the lowest point of descent, with the rope end securely attached to the drum.
- When traction type hoisting machines are used, the rope shall be long enough to reach from the highest point of support to the lowest point of building structure plus rigging reeving lengths in accordance with manufacturer's instructions.
- Stirrups shall be located directly under the suspension points on a two point suspension scaffold.
- Two point suspension scaffolds shall be securely lashed to the building or structure to prevent them from swaying.
- Wire Rope:
 - Shall be capable of supporting at least six times the intended load.
 - Use wire rope and fittings specified by hoisting machine manufacturer.
 - The number and use of wire rope clamps shall be in accordance with hoisting machine manufacturer's instructions. Prior to commencing work operation, pre-load testing of wire rope with maximum work load should be conducted, and clamps retightened to torque specifications (inspect clamps daily).
 - Damaged wire rope shall be replaced immediately. Wire ropes shall not be exposed to fire, undue heat, corrosives, or passage of electrical current. Make sure the platform is grounded.
- Fall Protection:
 - Employees shall wear an approved safety harness and lifeline.
 - The lifeline shall be securely attached to a substantial building support point, not the scaffold, or a securely rigged line.
 - The lifeline attachment point shall be appropriately changed as work progresses, so that a minimum amount of line slack and a fall of no greater than 6 feet is ensured.

SPECIAL MACHINE, HAND TOOL, AND POWER TOOL SAFETY – POWER TOOLS AND POWDER ACTUATED TOOLS

References: (a) 29 CFR 1910, Subparts O and P
(b) 29 CFR 1926, Subpart I

Basic Requirements:

- All hand and power tools and similar equipment, whether furnished by the employer or the employee, shall be maintained in a safe condition.
- When power operated tools are designed to accommodate guards, they shall be equipped with such guards when in use.
- One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are - barrier guards, two-hand tripping devices, electronic safety devices, etc.
- The following are some of the machines which usually require point of operation guarding: guillotine cutters, shears, powered presses, milling machines, power saws, jointers, portable power tools, and forming rolls and calenders.
- When the periphery of the blades of a fan is less than 7 feet (2.128 m) above the floor or working level, the blades shall be guarded. The guard shall have openings no larger than 1/2 inch.
- Machines designed for a fixed location shall be securely anchored to prevent walking or moving.
- Employees using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases shall be provided with the particular personal protective equipment necessary to protect them from the hazard.
- All hand-held powered platen sanders, grinders with wheels 2-inch diameter or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws, and jigsaws with blade shanks one-fourth of an inch wide or less may be equipped with only a positive "on-off" control. All hand-held powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels greater than 2 inches in diameter, disc sanders, belt sanders, reciprocating saws, saber saws, and other similar operating powered tools shall be equipped with a momentary contact

"on-off" control and may have a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on. All other hand-held powered tools, such as circular saws, chain saws, and percussion tools without positive accessory holding means, shall be equipped with a constant pressure switch that will shut off the power when the pressure is released.

- Employers shall not issue or permit the use of unsafe hand tools. Wrenches, including adjustable, pipe, end, and socket wrenches shall not be used when jaws are sprung to the point that slippage occurs. Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads. The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.
- Electric power operated tools shall either be of the approved double-insulated type or properly grounded.
- Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected. Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.
- Only employees who have been trained in the operation of the particular tool in use shall be allowed to operate a powder-actuated tool. Powder-actuated tools used by employees shall meet all applicable requirements of ANSI A10.3-1970, Safety Requirements for Explosive-Actuated Fastening Tools.
- Refer to references (a) and (b) and the manufacturers' operator's manuals for additional requirements concerning the safe use of tools and equipment.

TREE MAINTENANCE

References: (a) DoD MIL-HDBK 1025/10, Safety of Electrical Transmission and Distribution Systems
(b) USACE Safety & Health Requirements Manual EM-385-1-1, Section 31
(c) 29 CFR Part 1910.269, "Power Generation, Distribution, and Transmission Standard"

Basic Requirements:

- Ladders and/or aerial lifts shall be used for tree work.
- Trees or limbs shall be lowered with rope when there is a danger of personnel and/or property damage.
- Employees working in trees shall use safety harnesses and lifelines.
- Tree trimming near energized lines is prohibited. Only personnel qualified and certified in accordance with reference (c) may approach within ten feet of energized overhead electrical lines.
- When working near energized lines, lifelines shall be arranged so a fall will carry the employee away from energized conductors. Employees shall consider all electrical equipment and conductors as energized with potentially fatal voltage, never to be touched either directly or indirectly. Employees shall not be permitted closer to exposed energized parts than shown in Table 11-5 of reference (b).
- All tools shall be raised and lowered with a hand line.
- Work areas shall be cleared to permit safe working conditions and a planned escape route before tree work is started.
- Audible warning signals shall be given prior to falling of trees or limbs.
- When placing an employee in a tree with an aerial device, employee shall be safely secured to the tree with a climbing rope before removing safety line attached to the basket.

Sources of Help: 1) Activity NAVOSH Personnel
2) EFD Construction Safety POC

TRENCHING/EXCAVATIONS

Reference: (a) 29 CFR Part 1926.650 thru 1926.652
(b) USACE Safety & Health Requirements Manual EM-385-1-1,
Section 25

General:

- Although cave-ins are of major concern, flooding, shock, asphyxiation, electrocution, fire, explosion, collapse of undermined installations are all serious hazards that merit concern when planning or performing excavation work.
- Prior to digging, the exact location of electric power, natural gas and water lines must be identified and marked.
- Weather and climate can adversely affect conditions at job sites. Rain, melting snow, ground water, etc., can loosen soil and/or increase pressure on walls.
- Man-made hazards such as spoils (excavated materials), heavy equipment, timbers, etc., can exert great pressures on trench walls. Vibrations caused by moving machinery, vehicle traffic, etc., can loosen soil and cause walls to collapse.
- A hazardous atmosphere may develop in trenches/excavations. Poisonous gases and/or combustible gases can build up in confined spaces which can overcome workers, lead to danger of fire or explosion or result in oxygen deficient atmosphere. Potential locations where a hazardous or oxygen deficient atmosphere may exist include, but are not limited to, landfill areas, areas near underground fuel and gas tanks, and areas near natural gas, sewer lines, etc.

Basic Requirements:

- A competent person must supervise all excavation work and inspect sites at least daily prior to the start of work, throughout the shift, and after every hazard increasing event such as rain storms, earthquakes, etc. Reference (a) defines a “competent person” as one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

- Unless excavating in stable rock or digging less than five feet down and examination of the ground by a competent person provides no indication of a potential cave-in, a protective support system of (1) sloping or benching; or, (2) shoring and shielding must be employed.
- Shoring sheeting consists of tightly placed timber shores, bracing, trench jacks, etc., installed in a manner strong enough to resist the pressures surrounding the excavation. Shoring must be designed and approved by a registered professional engineer. Trench shields, which are prefabricated movable structures composed of steel plates welded to a heavy steel frame may also be used. Plywood sheeting used to prevent sloughing at the trench face must be a minimum of 1-1/4 inches thick.
- Ladders must be located within 25 feet of any workers in trenches four feet deep or more. If ramps are used in lieu of ladders, the angle of egress must allow employees the ability to walk upright.
- Excavated material and other objects must be at least two feet away from the edge of an excavation.
- Walkways or bridges with guardrails must be provided whenever employees are required to cross over trenches.
- Protective equipment such as hard hats, safety glasses and safety shoes should be required and worn by all personnel.
- Upon completion, shoring should be removed from the bottom up, sheeting should be pulled out from above and the excavation back-filled immediately after the support system is removed.
- Adequate barrier protection must be provided for trenches/excavations at the end of the shift. Special precautions must be provided for trenches/ excavations in housing areas.

WELDING/CUTTING

Reference: (a) 29 CFR Part 1910 Subpart Q Welding, Cutting and Brazing
(b) ANSI Z49.1 - 1994

Basic Requirements:

- All welding and cutting equipment shall be kept in working condition. Equipment shall be inspected to ensure proper working condition. If equipment is defective it shall be removed from service.
- Welding and cutting shall not be performed unless the atmosphere is nonflammable and combustibles can be separated from fire hazards.
- Fire extinguishing equipment shall be maintained, ready for use, while welding and cutting are being performed.
- A trained fire watch is required whenever welding or cutting is performed in locations where a fire might develop.
- All welding and cutting equipment shall be placed so it is clear of passageways, ladders and stairways.
- Suitable, approved eye protection shall be worn by all personnel exposed to the hazards of the particular welding or cutting operation being performed. All eye protection, including filter lenses and plates shall meet the specifications prescribed in ANSI Z87.1-1994.
- All welders and oxygen cutters shall wear protective gloves. Appropriate protective clothing shall be worn and selected on the basis of the size, nature, and location of the operation.
- When welding or cutting in confined spaces:
 - Gas cylinders and welding power sources shall be located outside the space
 - Means shall be provided for quick removal of the worker in case of an emergency
 - A worker, capable of putting a preplanned rescue procedure into effect, shall be stationed outside the space to observe the worker at all times

- Adequate ventilation shall be used to prevent the accumulation of toxic materials or possible oxygen deficiency
- Potentially hazardous materials are employed or released during welding or cutting. These hazards include but are not limited to: cadmium, fluorine compounds, zinc, lead, beryllium, mercury, cleaning compounds, and stainless steel. The hazards and hazardous properties of these materials must be determined and controlled before welding or cutting operations commence.
- Local exhaust or general ventilation shall be provided and arranged to keep levels of toxic fumes, gases, or dusts below acceptable concentrations as prescribed by the threshold limit values of the American Conference of Governmental Hygienists, or the exposure limits established by OSHA.
- Specific requirements for oxygen fuel gas welding and cutting are listed in 29 CFR Part 1910.253. Requirements for arc welding and cutting are described in 29 CFR Part 1910.254 and specific requirements for resistance welding are listed in 29 CFR Part 1910.255.

Sources of Help: 1)Activity OSH Personnel

WEIGHT HANDLING EQUIPMENT

References: (a) NAVFAC P307, Management of Weight Handling Equipment
(b) OPNAVINST 5100.23 Series, Chapter 31
(c) 29 CFR 1926, Subpart N
(d) 29 CFR 1910, Subpart N

Background:

- Reference (a) provides requirements for the maintenance, inspection, test, certification, repair, alteration, operation, and/or use of weight handling equipment (WHE) and related equipment under the technical cognizance of the Naval Facilities Engineering Command (NAVFAC). Navy crane operations must comply with relevant portions of references (a) through (d).
- Personnel involved in the maintenance, alteration, repair, inspection, testing, and operation of WHE, shall be technically competent to perform their assigned duties. Specific requirements for crane operator qualification and licensing are addressed sections 6 and 7 of reference (a). For other personnel involved in the WHE program, appendix N of reference (a) addresses qualification and/or training requirements. Records of training or other verification of competency shall be maintained.
- Contractors that operate cranes aboard navy facilities must comply with specific activity regulations pertaining to crane safety and operation, and must notify the contracting officer, in advance, of any cranes entering the activity. Contractors must comply with ASME B30.5 for mobile cranes, and ASME B30.22 for articulating boom cranes. Contractors must provide a certificate of compliance that certifies that the crane and rigging gear meet applicable OSHA regulations. The contractor must also certify that all of its crane operators working on the naval activity are qualified and trained for the operation of the crane to be used. These certifications must be posted on the crane. A critical lift plan is required for any lift over 80 percent of the capacity of the crane or hoist (at any radius of lift); any lift involving more than one crane or hoist; any lift of personnel; and any lift involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. Reference (a) provides additional details.

ACCIDENT ABSTRACTS

“Abstracts of Accidents” that have occurred during the past several years on facility construction projects and during Public Works operations are published periodically by the NAVFACENGCOM Facilities Safety and Health Support Office and added to their WebPages at <http://www.navfac-safety.navy.mil/abstract.htm>.

The abstracts provide a brief description of the mishap, contributing causes and identify lessons learned. They are intended for widest dissemination and may be posted on bulletin boards and/or used by supervisors during “stand up” safety talks to prevent reoccurrence. They are organized to search in two different ways: by Fiscal Year (FY89 to present) or by Accident Type:

- Amputation
- Burn
- Confined Space Injury
- Crushing
- Drowning
- Electrical (including Electrocution)
- Elevator Mishaps
- Equipment, Construction
- Equipment, Lawn Care
- Equipment, Materials Handling
- Equipment, Power Hand Tools
- Equipment, Weight Handling (Cranes)
- Excavation/Trenching
- Exposure to Biological Hazards
- Exposure to Chemical Hazards
- Fall
- Fracture
- Sprains, Strains, and Back Injury
- Struck By/Puncture Wound
- Structural Failure
- Vehicular

If you have accident abstracts that could be shared, please contact the NAVFAC FS&H Support Office at DSN 564-5193, COMM (757) 444-5193 or FAX (757) 445-9454, or email cchaffin@pwcnorva.navy.mil.

STANDARD OPERATING PROCEDURES

Standard Operating Procedures (SOPs) are developed from job hazard analyses that identify the hazards or potential hazards associated with each step of a particular job, determine the severity of the hazard, attempt to establish a probability of accident occurrence, and attempt to eliminate hazards. Over 700 samples of SOPs developed by Public Works Centers are available from the NAVFACENGCOM Facilities Safety and Health Support Office WebPages at <http://www.navfac-safety.navy.mil/sop.htm>

The sample SOPs provide guidance for a wide range of operations involving inspection, operation, repair, maintenance, and replacement of electrical, steam, and various other types of equipment. They may be modified to fit activities needs, thus saving time in developing them from scratch. They are organized to search alphabetically by type of operation.

If you have SOPs that could be shared, please contact the NAVFACENGCOM Facilities Safety and Health Support Office at DSN 564-5193, COMM (757) 444-5193 or FAX (757) 445-9454, or email cchaffin@pwcnorva.navy.mil.